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San Francisco City Planning Commission

Environmental Impact Report

DAON BUILDING

BATTERY AND SACRAMENTO STREETS

Draft
EE 79.57

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San Francisco City Planning Commission

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Written comments should be sent to the Environmental Review Officer, 45 Hyde St., San Francisco, CA 94102

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I. SUMMARY

A. PROJECT DESCRIPTION

The proposed project site is located at the southeast corner of Sacramento and Battery Sts. in Lots 14, 15 and 16 of Assessor's Block 237. The proposed 25-story, 351-ft.-tall office building, would contain approximately 289,000 gross sq. ft., exclusive of 1 mechanical floor. The facade of the building would be a lightweight material and tinted glass; there would be landscaped setbacks at the 2nd, 6th and 14th floors. The ground floor would have a savings and loan savings office of 4,500 net sq. ft., and 3,800 net sq. ft. of retail space off an open pedestrian walkway passing diagonally between Sacramento and Battery Sts. The 2nd through 24th floors would contain about 239,000 net sq. ft. of office space. The 25th floor would be a double-height mechanical floor. No off-street parking would be provided; there would be 2 loading docks. The principal tenant would be the San Francisco Federal Savings and Loan Association, which would occupy about 20% of the leasable office space, including its main savings office on the ground floor.

Demolition of the 3 existing buildings on the project site would start in 1980 and take about 8 weeks. Excavation and construction would then continue for about 18 months until project completion and occupancy in late 1981.

B. ENVIRONMENTAL EFFECTS

The proposed project would comply with zoning use and height and bulk limitations for the site. Construction of the project would require demolition of 3 buildings; 2 of these are rated "0" and "1" in the Department of City Planning's 1976 Architectural Inventory and "B" in the 1979 Heritage architectural survey and historic resources inventory. The open pedestrian walkway with shop windows would provide pedestrian interest. The project would add to the cumulative visual impact on the skyline of development under construction and proposed for the Downtown business district; it would not

obscure views of the Bay from pedestrian levels on Nob or Telegraph Hills. During the spring and fall the project tower would shade the podium level of Two Embarcadero Center in the early afternoon. It would add to the shadowing of that area on winter afternoons.

Demands for water, sewer services, solid-waste disposal, and police and fire protection would increase during construction and operation of the proposed project. These demands could be met by existing systems; no additional police or fire department personnel would be required. Extension of telephone conduit would disrupt 1 of 2 lanes of traffic on Sacramento St. for up to 2 weeks. It is estimated that the proposed project would provide about 190 person-years of construction employment. Approximately 1,200 persons would be employed at the completed building, as compared to current employment on the site of about 250 persons. Eleven businesses would be displaced from the site. After completion, the project would generate a net increase over existing total composite property tax revenues to San Francisco of between $229,500 and $270,200. The project could contribute to a short-term cumulative oversupply of office space in the 1980's.

Construction trucks would increase truck traffic on access streets and haul routes. Project-generated traffic would cause increases in traffic on adjacent streets ranging from about 2% on Battery St. to about 7% on Beale St. This would increase the volume-to-capacity ratios at the intersections studied, but would not reduce the Levels of Service.

No parking would be provided on the site in accordance with the revised Downtown Transportation Plan. The project would contribute to local traffic volumes, transit ridership and cumulative impacts on regional air quality caused by development now under construction and proposed for the Downtown business district.

Pile driving and the operation of construction equipment could temporarily raise noise levels from about 75 dBA to 80 to 85 dBA within buildings across Battery St. which require open windows for ventilation. Increased noise levels due to project operation would not be measurable.

The project would be designed and constructed to be within the minimum standards for energy conservation established by the California Energy Commission. Annual electrical consumption would be about 4.7 million kilowatt hours; annual natural gas consumption would be about 3.1 million cu. ft.

C. ALTERNATIVES TO THE PROPOSED PROJECT

The no-project alternative would preserve options for future development of the site. The 2 existing buildings rated "O" and "1" in the 1976 Architectural Inventory and "B" in the Heritage survey would not be demolished.

An alternative design would maximize the floor area, while continuing to conform to zoning use and height and bulk limitations for the site. Such a building would be about 400 ft. tall and would be set back from the eastern property line to provide a passage between Sacramento and Halleck Sts. It would have about 23% more floor area than the proposed project. Shadow and wind effects, demands on community services and volumes of traffic generated would be greater than the effects of the proposed project.

An alternative which would conform to the Initiative to Limit the Height and Floor Area Ratios of Buildings in Downtown San Francisco (defeated on Proposition O in the November 1979 election) could be developed on the site. At the Basic Floor Area Ratio of 8 to 1, such a design would contain about 1/2 the floor area of the proposed project. If housing were added, the gross floor area could be increased by the housing bonus to about 245,000 sq. ft. (15% less than the project as proposed); about 40 residential units in Downtown San Francisco would then be provided.

An office building could be designed retaining the facades of 353 Sacramento St. and 280 Battery St. Preservation of the facades would reduce the change to the existing pedestrian environment caused by the proposed project. Development of an integrated architectural design would be difficult because the 2 buildings are not of the same height or style.

II. PROJECT DESCRIPTION

A. OBJECTIVES OF THE PROPOSED PROJECT

Daon Corporation, a Canadian development firm with offices in San Francisco, proposes to construct an office building in Downtown San Francisco to provide a return on invested capital. The project, designed by the San Francisco office of Skidmore, Owings and Merrill, is intended by its sponsors to be a part of the Downtown Office District which is described in Section 210.3 of the City Planning Code (Part II, Chapter II of the San Francisco Municipal Code) as "playing a leading national role in finance, corporate headquarters and service industries, and serving as an employment center for the region", and which consists "primarily of high quality office development". The District is one in which unrelated uses are excluded "in order to conserve the supply of land in the core and its expansion areas for further development of major office buildings". San Francisco Federal Savings and Loan Association would be the principal tenant, occupying about 20% of the 289,000 gross sq. ft. proposed.

B. LOCATION OF THE PROPOSED PROJECT

The proposed Daon Building would be located at the northwest corner of Assessor's Block 237, which is bounded by Battery, Front, Sacramento and California Sts. Halleck St. bisects the block (see Figure 1). The building would entirely occupy Lots 14, 15 and 16 which contain about 18,900 sq. ft.

The project site is in the northeastern portion of the Financial District, immediately south of One Embarcadero Center, and fronts on Sacramento and Battery Sts. The site is about 3-1/2 blocks from the Embarcadero Station of the Market St. subway which serves the Bay Area Rapid Transit system (BART) and the future Muni Metro light rail system, and within 5 blocks of other regional transit systems, including SamTrans, A-C Transit and the Marin ferry boats. The site is served by Muni buses on Battery and Sacramento Sts., a

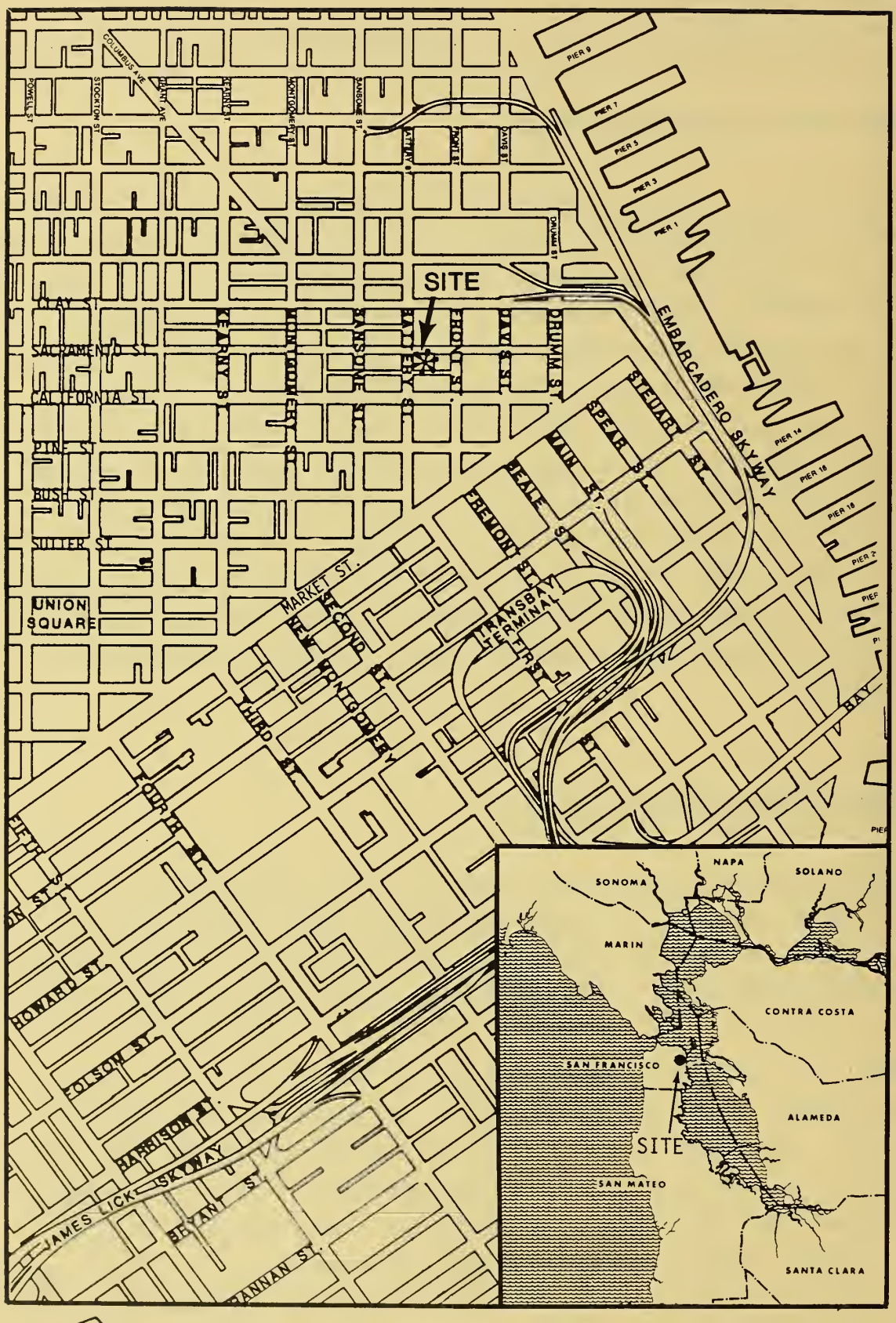


FIGURE 1: SITE LOCATION IN RELATION TO THE BAY REGION AND TO DOWNTOWN SAN FRANCISCO

cable car line on California St. and the Golden Gate Transit bus lines on Battery St. Freeway ramps connecting with the San Franciso-Oakland Bay Bridge (I-80) and the Bayshore Freeway (U.S. 101) are within 5 blocks of the site.

C. SITE AND BUILDING PLAN

The proposed 351-ft.-high project would have 25 stories, including 24 stories of usable space and a double-height mechanical floor. The facade would be a curtain wall of a lightweight material with non-glare, tinted glass in a horizontal arrangement; solar gray glass is currently under consideration (see Figure 2). The building would have 3 setbacks. A rectangular setback would be placed at about 30 ft. on the second floor along Sacramento St. The sixth floor would have a triangular setback at about 80 ft. at the corner of Battery and Sacramento Sts. between the entranceways, and the 14th floor (about 185 ft.) would have a triangular setback at the corner of Halleck and Battery Sts. (see Figures 3 through 6, pp. 8 through 11, for Project Elevations). Planters with vines and flowers or other greenery would be placed on each setback.

The gross floor area of the building, excluding the mechanical floor and 2 loading docks, would be about 289,000 sq. ft. Approximately 277,000 gross sq. ft. of offices would be located on the second through 24th floors; this would be about 239,000 net rentable sq. ft. The 12,000 gross sq. ft. of floor area on the ground floor would include a lobby with elevators serving the office floors, 2 areas containing 3,800 net sq. ft. of retail space and, at the Battery and Sacramento St. corner of the building, the main savings office of 4,500 net sq. ft. for San Francisco Federal Savings and Loan Association (see Figure 7, p. 12). An open pedestrian way would pass diagonally through the building, connecting the sidewalks on Battery and Sacramento Sts. and leading to the lobby. Shop windows for the retail areas would front on the pedestrian way (see Figures 8 through 10, pp. 13 through 15, for representative floor plans). No off-street parking would be provided.

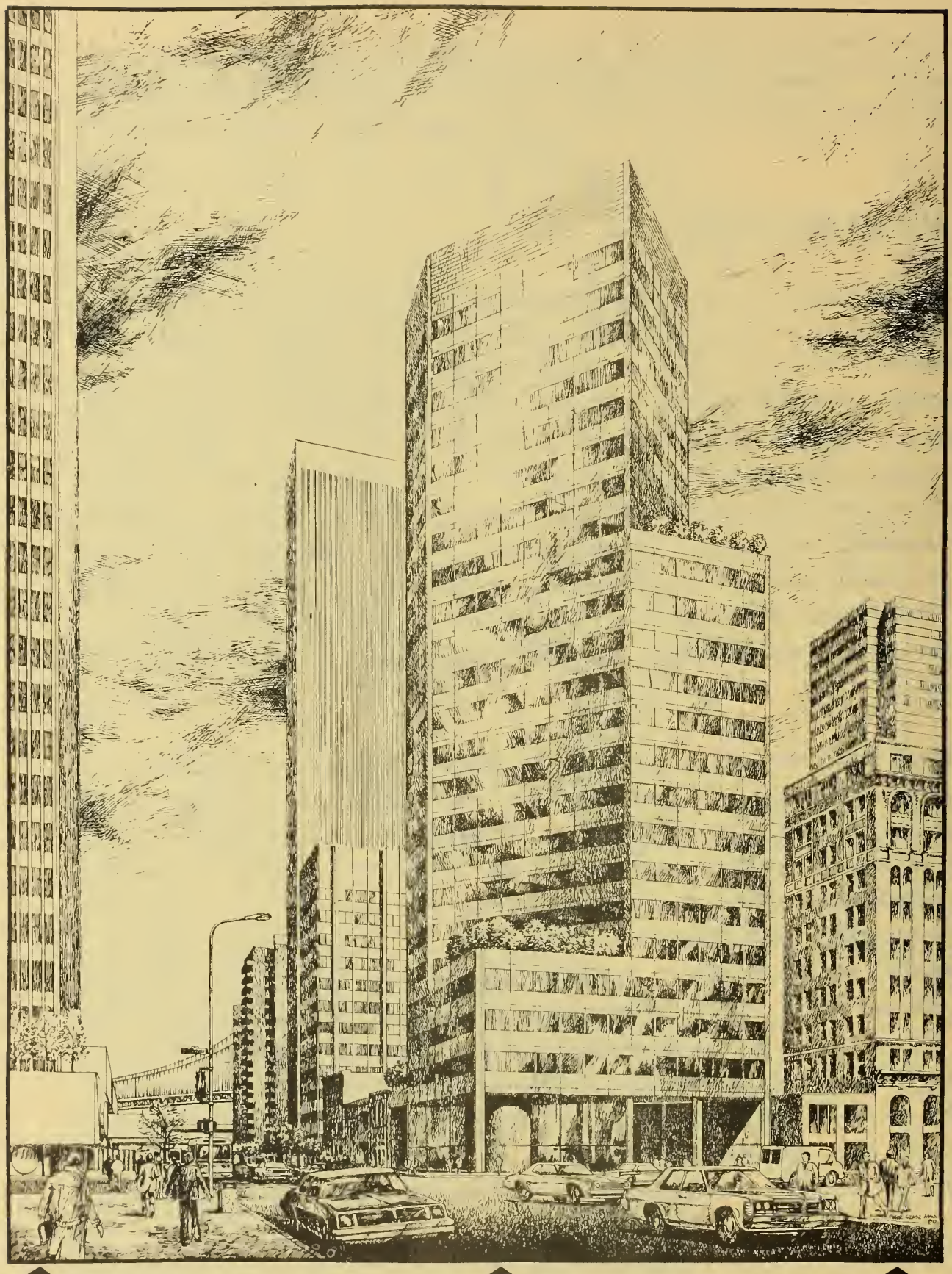
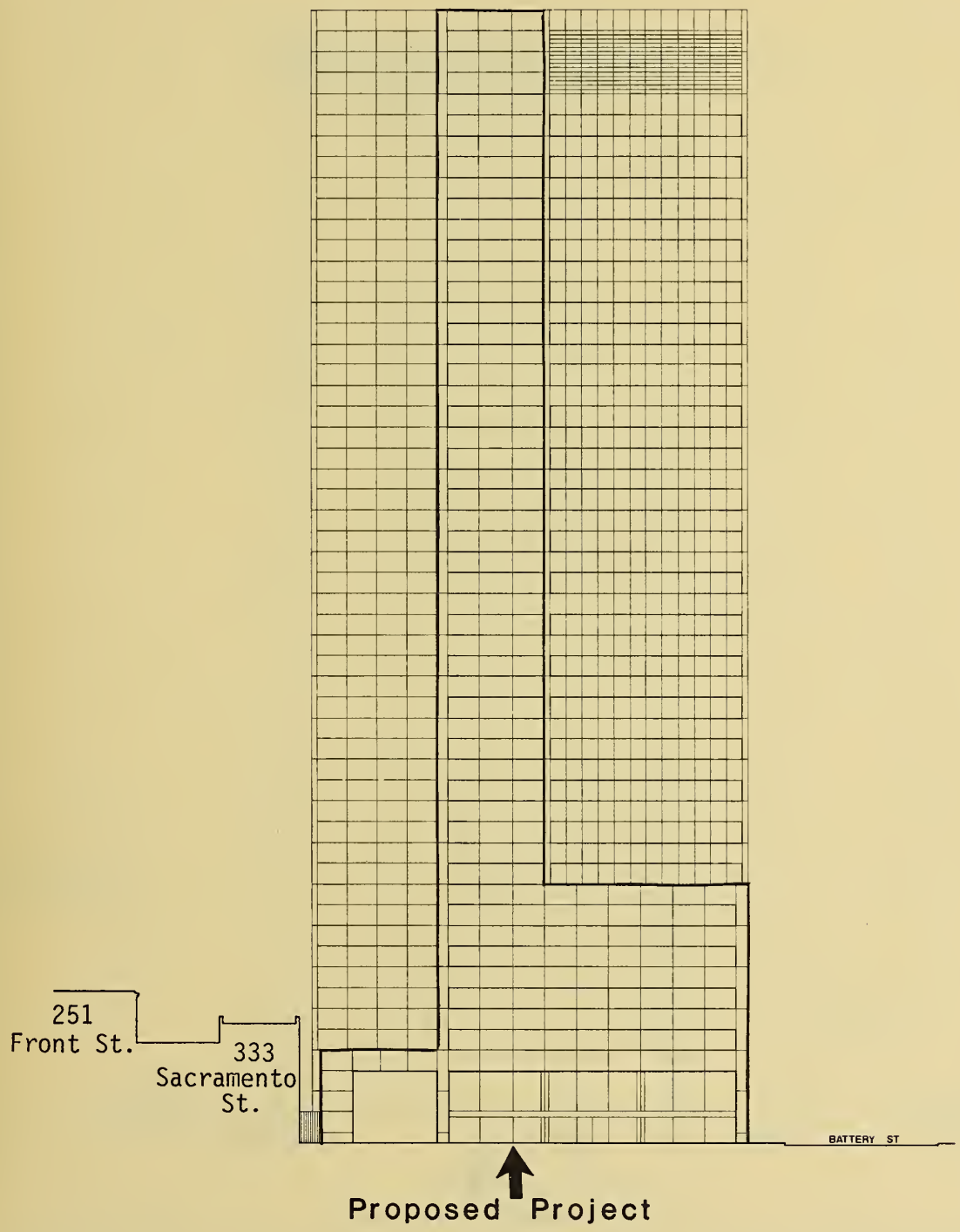


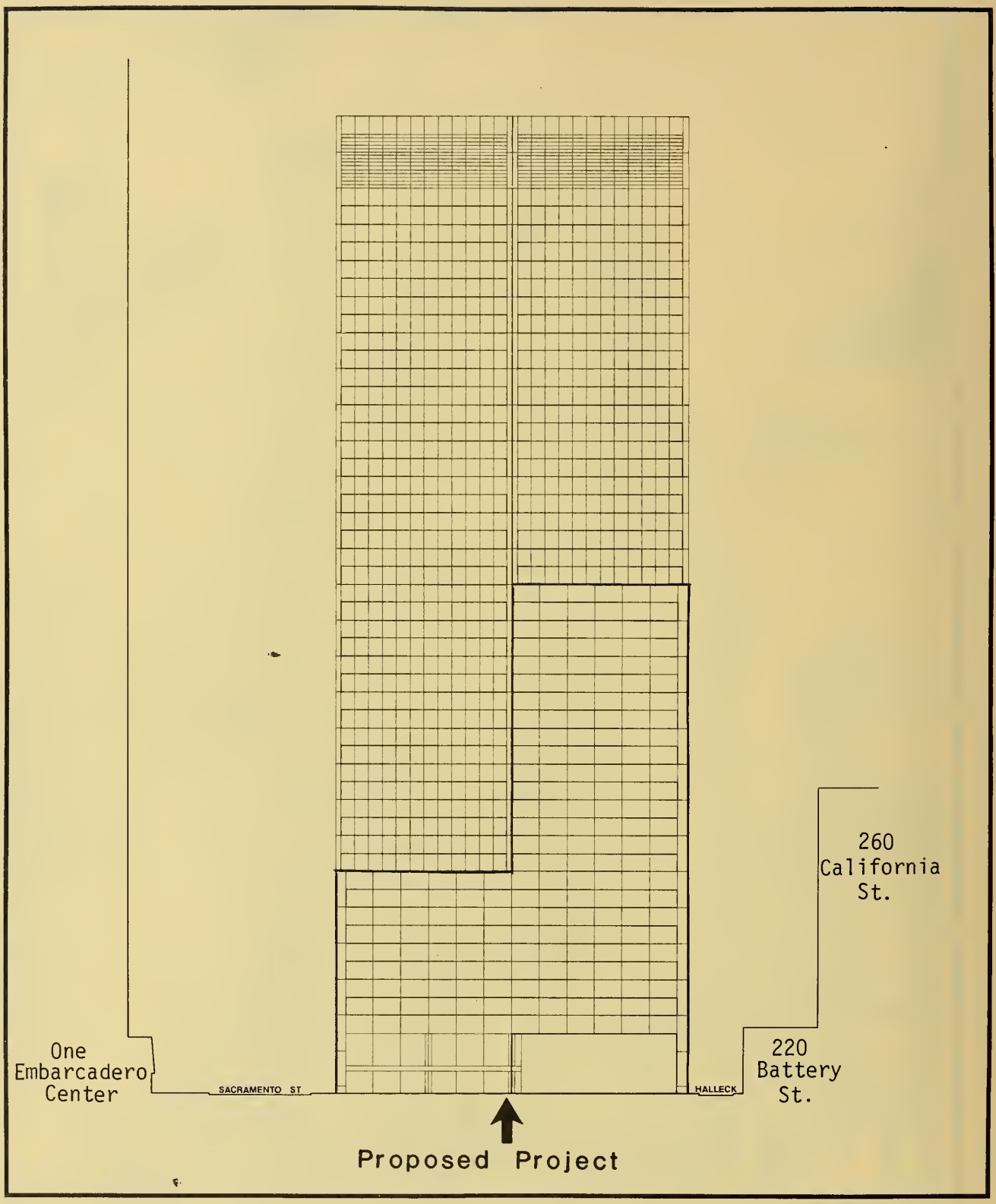
FIGURE 2: ARTIST'S RENDERING OF THE PROPOSED PROJECT. VIEW FROM THE NORTHWEST CORNER OF BATTERY AND SACRAMENTO STS.



0 60´

SOURCE: Skidmore, Owings & Merrill

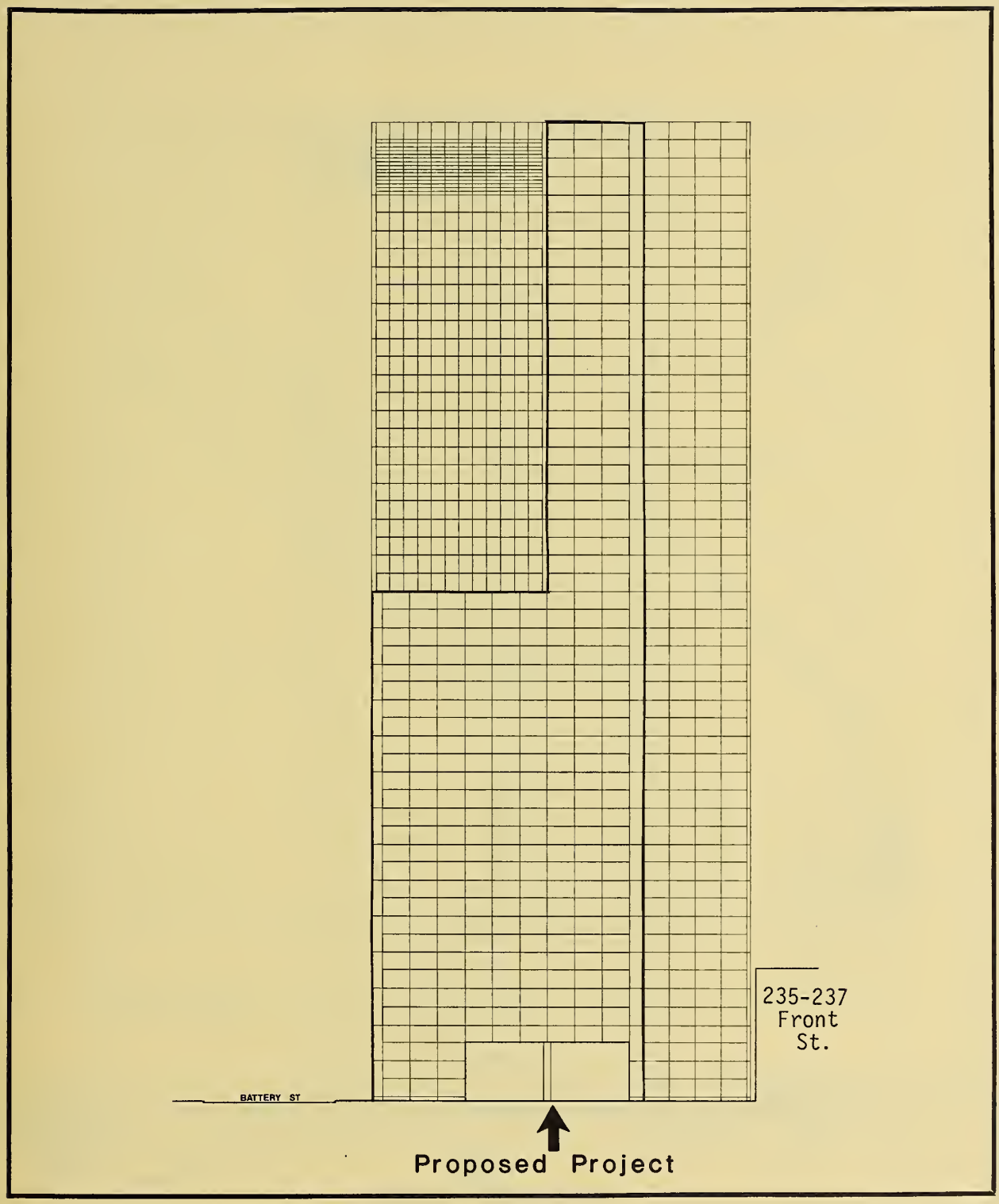
FIGURE 3: NORTH ELEVATION
(SACRAMENTO STREET)



0 60´

SOURCE: Skidmore, Owings & Merrill

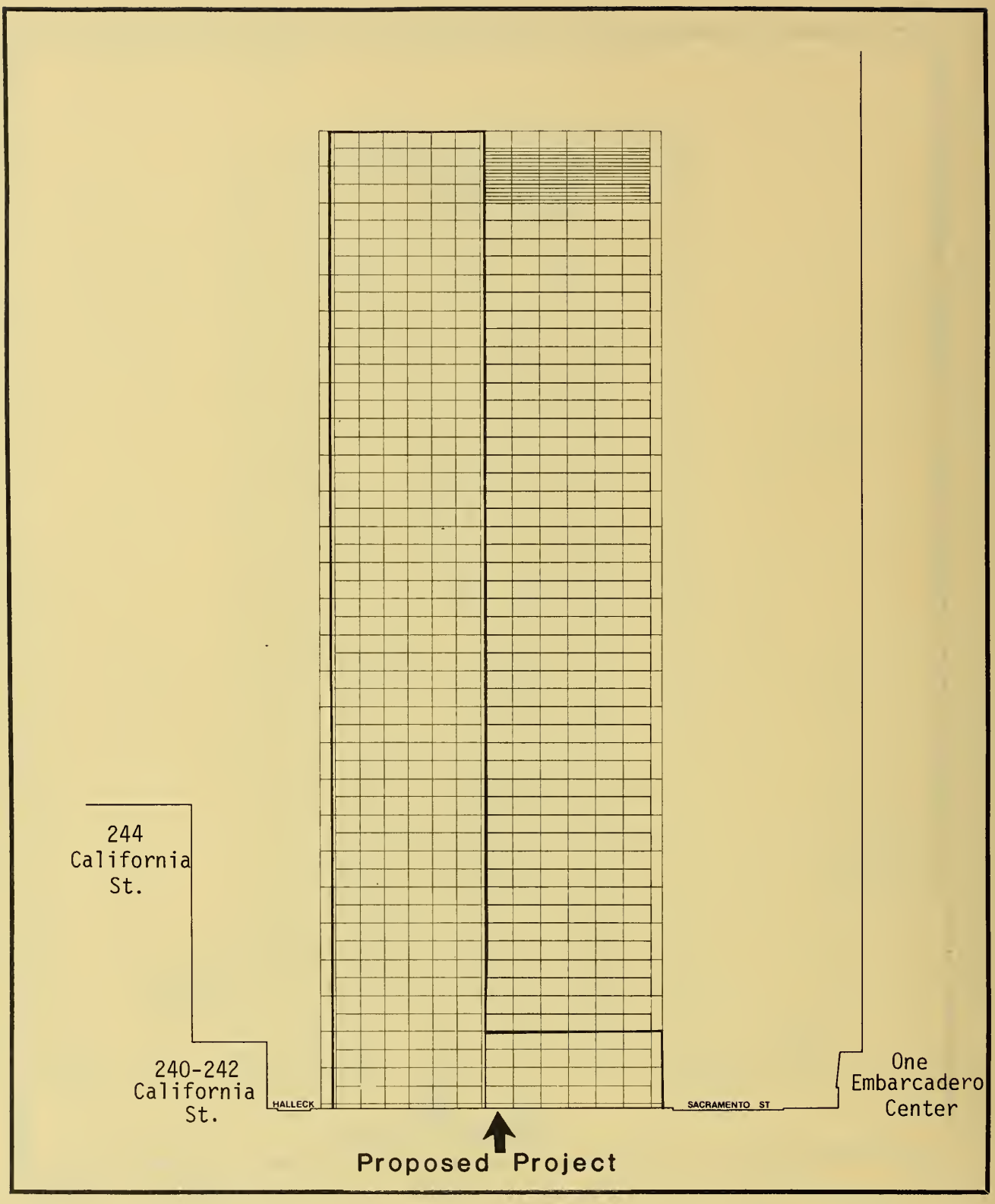
FIGURE 4: WEST ELEVATION
(BATTERY STREET)



0 60´

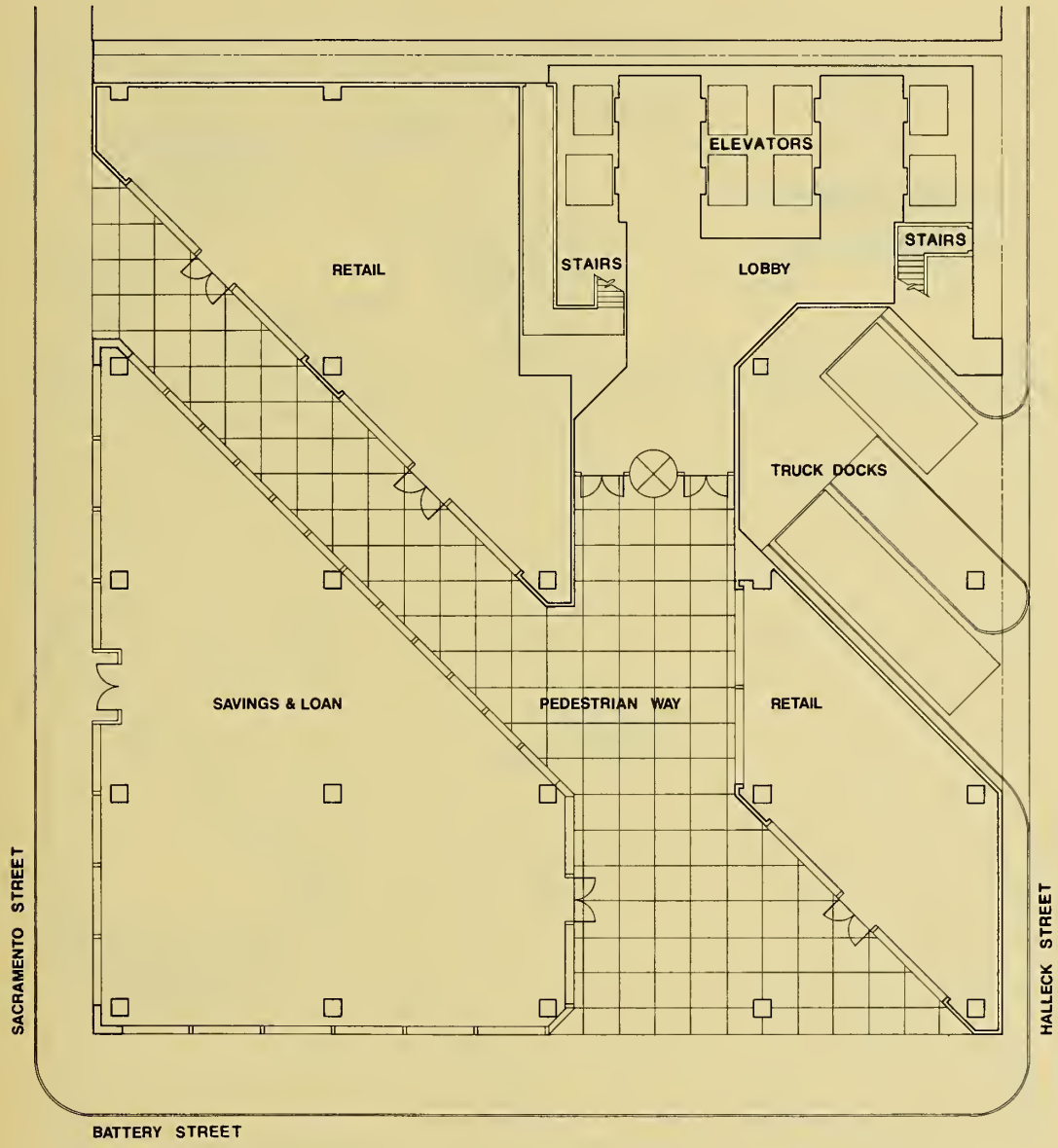
SOURCE: Skidmore, Owings & Merrill

FIGURE 5: SOUTH ELEVATION
(HALLECK STREET)



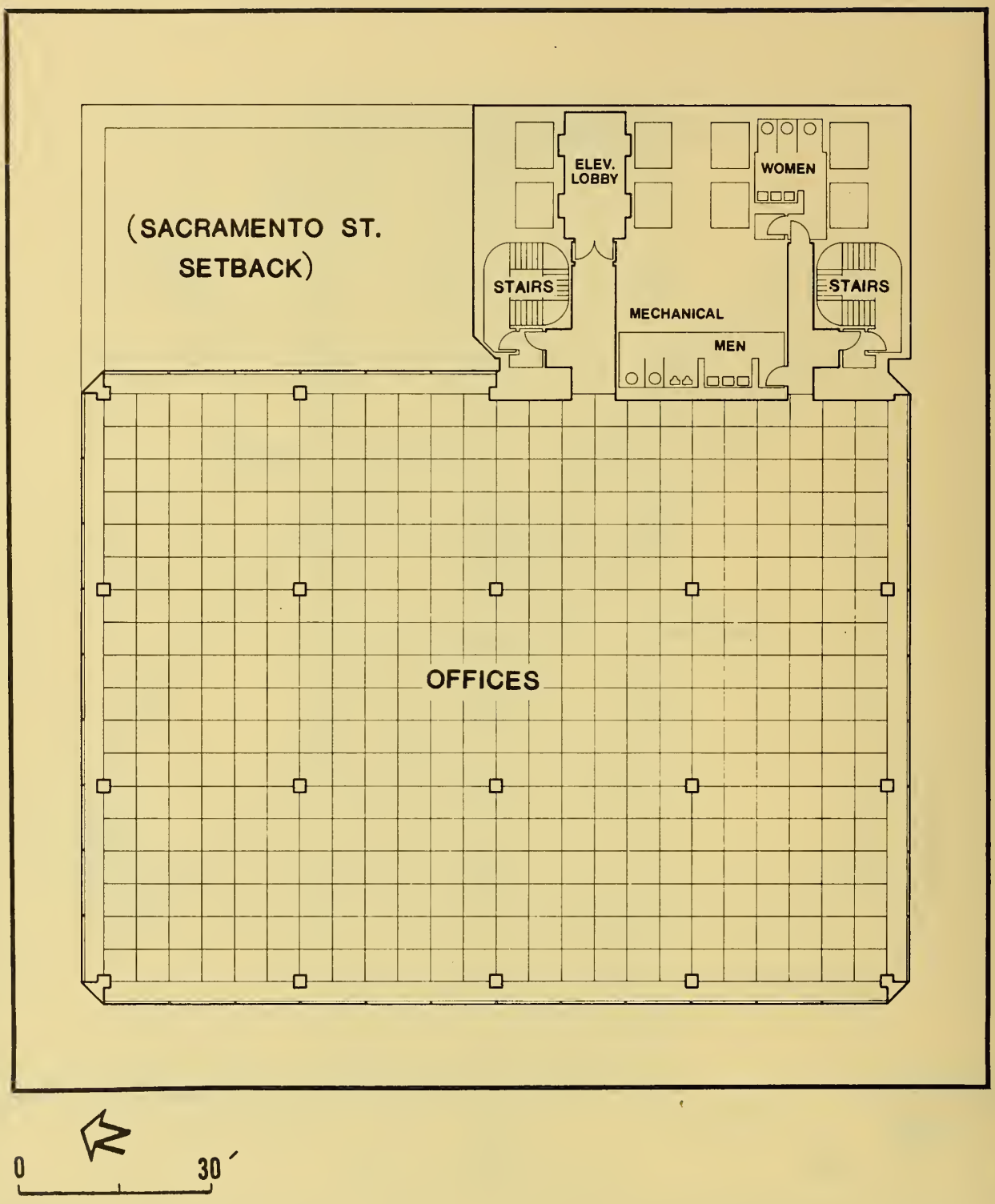
SOURCE: Skidmore, Owings & Merrill

FIGURE 6: EAST ELEVATION



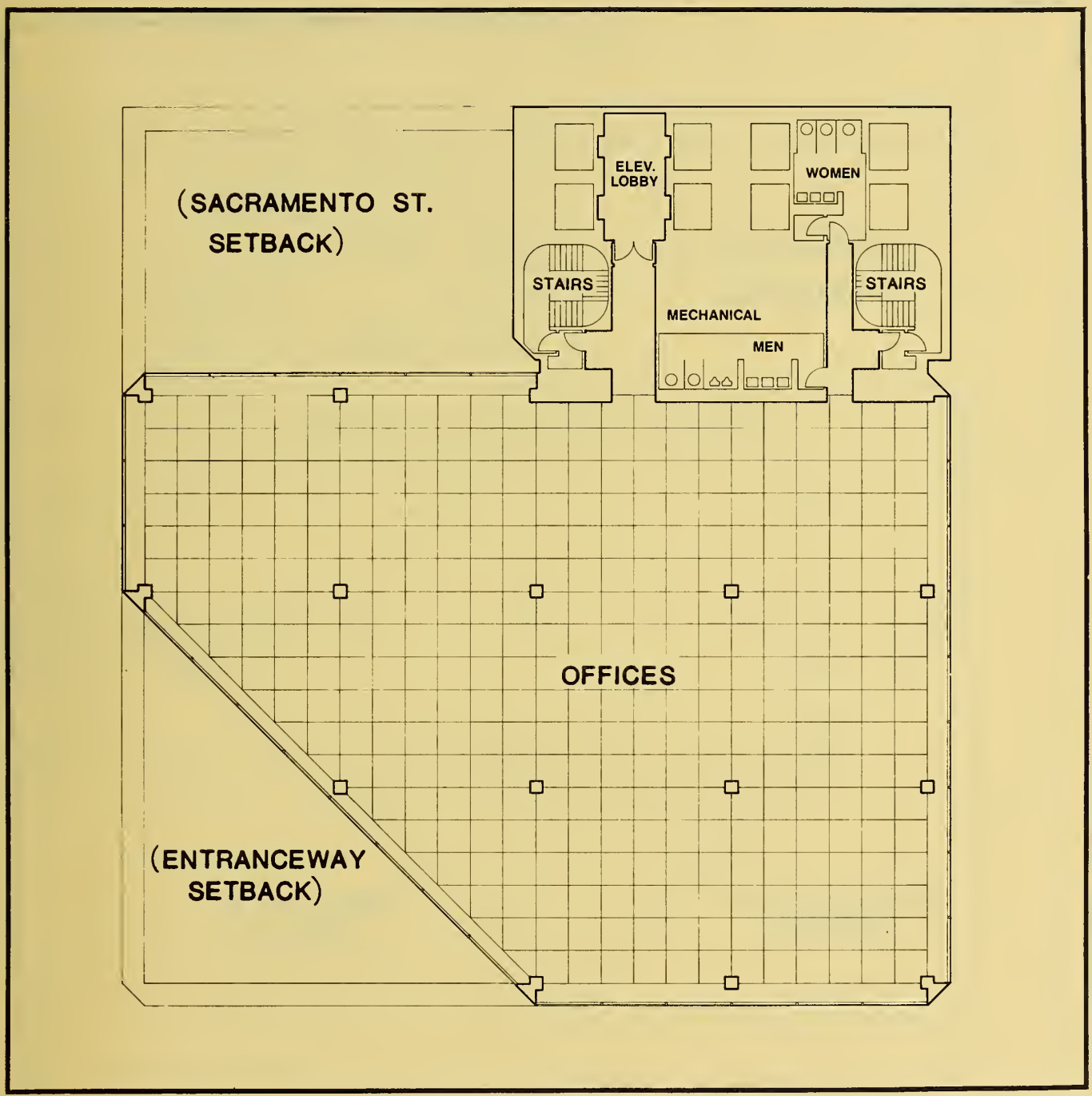
SOURCE: Skidmore, Owings & Merrill

FIGURE 7: GROUND FLOOR AND SITE PLAN



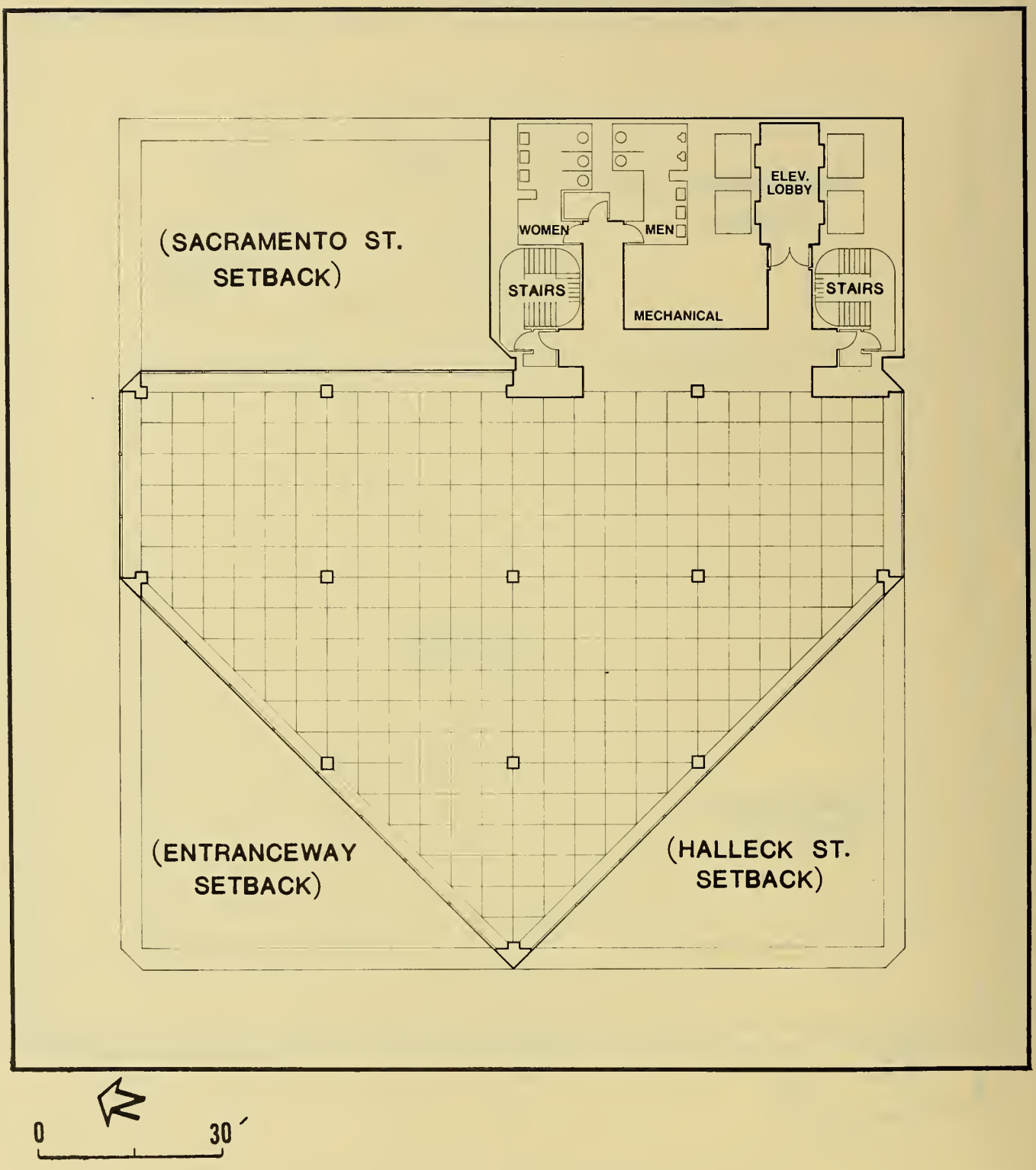
SOURCE: Skidmore, Owings & Merrill

FIGURE 8: FLOORS 2 THROUGH 5



SOURCE: Skidmore, Owings & Merrill

FIGURE 9: FLOORS 6 THROUGH 13



SOURCE: Skidmore, Owings & Merrill

FIGURE 10: FLOORS 14 THROUGH 24

D. PROJECT SCHEDULE, REQUIRED ACTIONS AND COSTS

Detailed design of the Daon building and certification of the Environmental Impact Report (EIR) are scheduled for early 1980. Demolition of the buildings on Lots 14, 15 and 16 would begin in mid-1980, after approval of the project by the City Planning Commission and issuance of demolition, site and other permits, followed by construction of the project (see Table 1). First occupancy is scheduled for late 1981. The cost of construction is estimated to be about $23 million in 1979 dollars.

TABLE 1: SCHEDULE OF CONSTRUCTION FOR THE DAON BUILDING

Building Activity	Weeks
Demolition	8
Excavation	10
Building Structure (steel)	17
Architectural Finishes	22
Interior Finishes	26*
TOTAL	83*

*Does not include all tenant improvements; these could take longer.

III. ENVIRONMENTAL SETTING

A. LAND USE AND ZONING

LAND USE

The project site is the northwest quadrant of Assessor's Block 237, bounded by Sacramento, Battery, California and Front Sts., in the downtown district of San Francisco. The block is presently occupied by older, pre-1950 office buildings with ground floor retail uses ranging from 2 to 11 stories. Halleck St., a 20-ft. wide alley used for service vehicle access, bisects the block from east to west and forms the southern boundary of the project site. The site itself presently includes 3 buildings; 240-248 Battery St. (which includes 335-337 Sacramento St.), 280 Battery St., and 353 Sacramento St. All of these structures have retail services on the ground floor, including restaurants, photo supplies and clothing stores (see Figure 11). Two are 2-story structures. The building at 353 Sacramento St. is 6 stories. See Table 2 for the amount of existing rentable space on the site.

TABLE 2: EXISTING NET RENTABLE SPACE ON THE SITE

240-248 Battery St. (includes 335-337 Sacramento St.)	2 stories	24,700 sq. ft.*
280 Battery St	2 stories	2,800 sq. ft.
353 Sacramento St.	6 stories	12,600 sq. ft.*
	Total	40,100 sq. ft.*

*Includes a total of 3,900 sq. ft. of basement storage space.

SOURCE: M and T Properties

Assessor's Block 230, directly north of the site, is occupied by One Embarcadero Center, a 45-story (567 ft.) office building with 3 levels of

353 Sacramento Street | 280 Battery Street | 240-248 Battery Street (Stone Soup)

A. View from the northwest corner of Sacramento and Battery Streets.

280 Battery Street | 240-248 Battery Street (Stone Soup) | Halleck Street

B. View from Halleck and Battery Streets east to the site. One Embarcadero Center is in the background.

FIGURE 11: Views of the Existing Site

retail uses. Two and Three Embarcadero Center (31-story, 414 ft. each) are northeast of the site on Assessor's Blocks 231 and 232. Assessor's Block 236 to the east of the project site is occupied by 1- to 7-story office and retail structures, and, on the eastern half of the block, the 14-story (190 ft.) 100 California St. office building. The block southeast of the site (Assessor's Block 263) is occupied by 5 structures ranging from 2 to 9 stories, and a 1-story parking structure; a vacant lot on Pine St. is also used for parking. The northeast portion of the block is vacant and fenced.

The 33-story (470 ft.) 100 Pine St. building, completed in 1972; the 14-story (200 ft.) Industrial Indemnity Company building at California and Battery Sts., completed in 1960; a 7-story office structure at Pine and Battery Sts., completed in 1957; and the 17-story (240 ft.) 201 California St. building occupy Assessor's Block 262, south of the project site.

Southwest of the site, on Assessor's Block 261, are pre-1950 retail and office structures ranging from 6 to 10 stories. The block west of the site (Assessor's Block 238) also includes older commercial and office structures, as well as the California First Bank headquarters, a 23-story, 325 ft. structure, at Sansome and California Sts., completed in 1977.

Assessor's Block 229, northwest of the site, is occupied by the 10-story, 350 Sansome St. building at Sacramento St., and the Federal Reserve Bank of San Francisco which is currently planning to construct new headquarters at Market and Spear Sts. Existing land uses on the site and vicinity are shown in Figure 12 (see Final EIR, Federal Reserve Bank of San Francisco, EE 78.207, certified 14 June 1979).

ZONING

The City Planning Code zoning classification for the project site is C-3-O, Downtown Office District (see Figure 13, p. 21). Office and retail uses are permitted in this District with a permitted Basic Floor Area Ratio of 14 to 1, i.e., buildings may have a floor area up to 14 times the area of the site. The site is also in the 450-I Height and Bulk District (see Figure 14, p. 22)

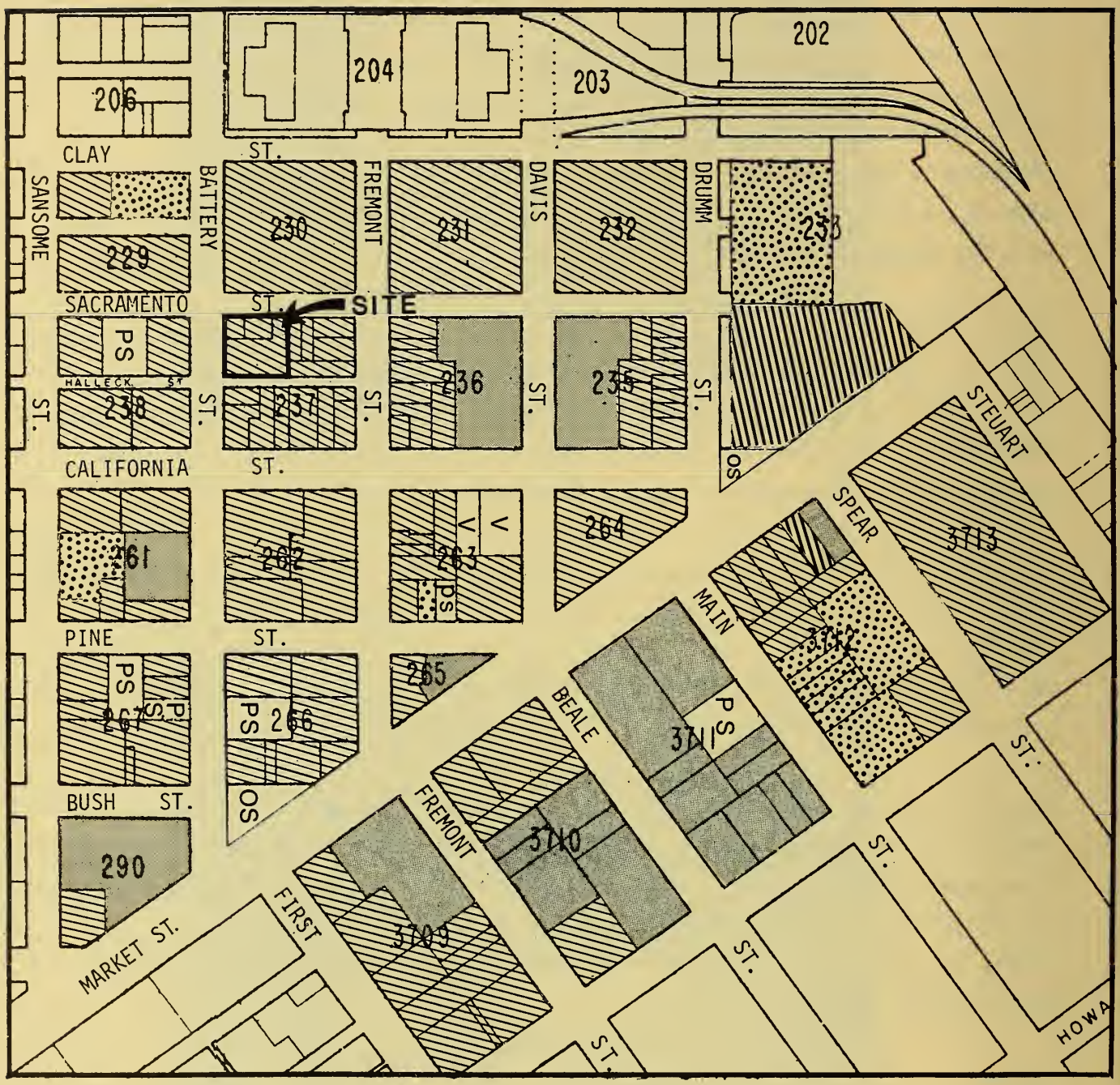
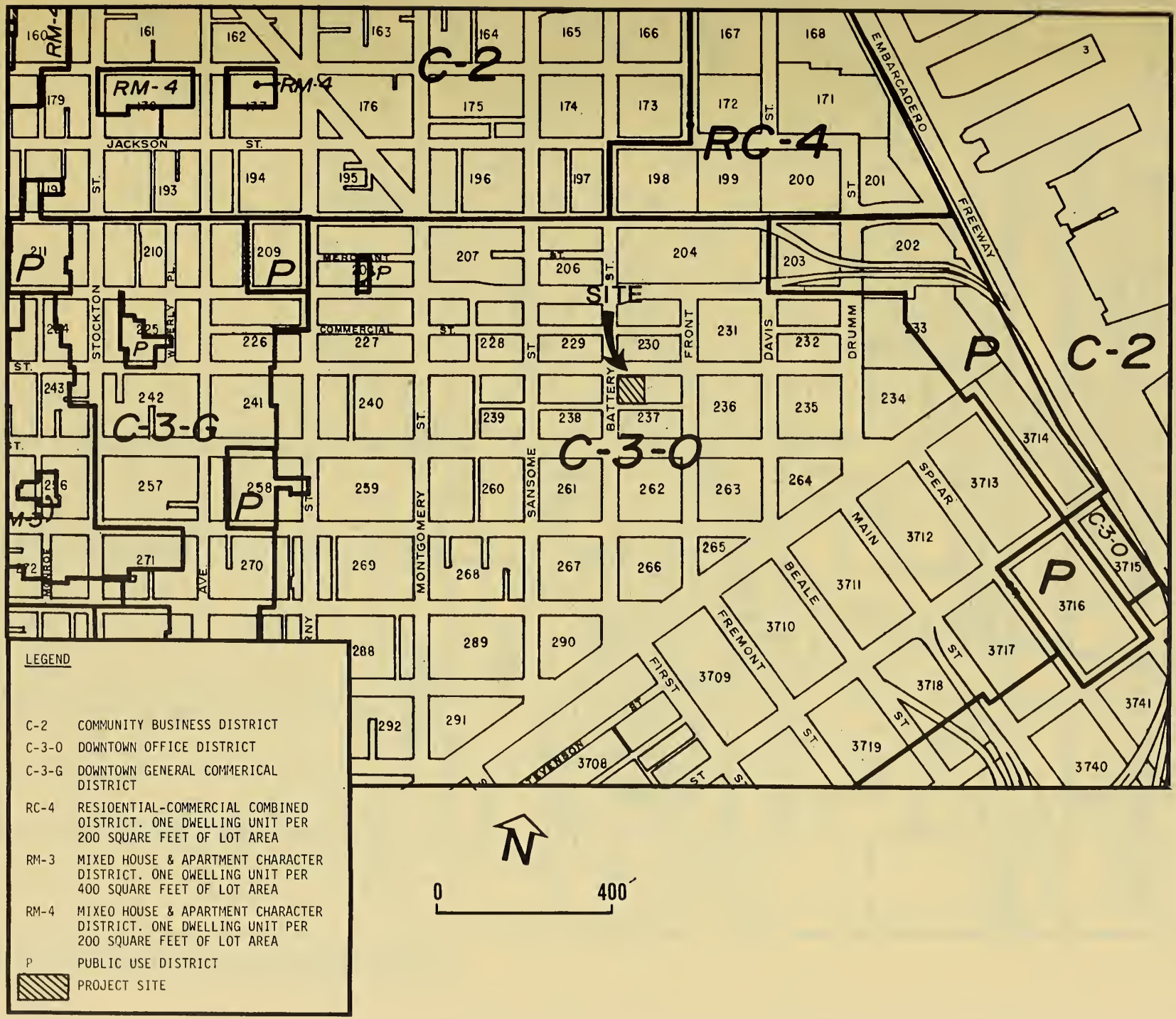
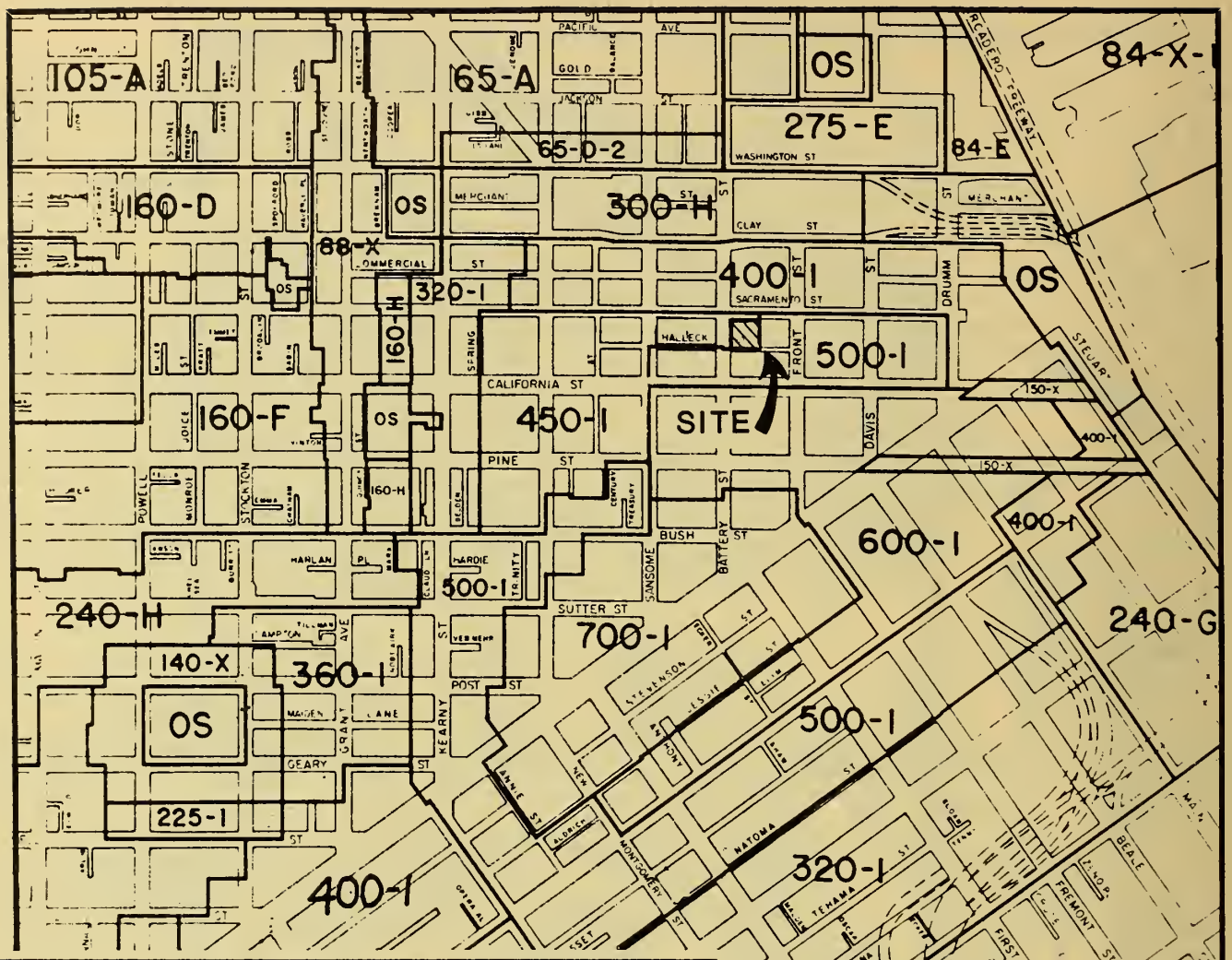


FIGURE 12: EXISTING LAND USE ON THE SITE AND IN THE VICINITY



SOURCE: San Francisco Municipal Code

FIGURE 13: EXISTING PLANNING CODE USE DISTRICTS



HEIGHT AND BULK DISTRICTS	HEIGHT LIMIT	HEIGHT ABOVE WHICH MAXIMUM DIMENSIONS APPLY	MAXIMUM BUILDING LENGTH	MAXIMUM DIAGONAL DIMENSION
700-I	700	150'	170'	200'
600-I	600	150'	170'	200'
500-I	500	150'	170'	200'
450-I	450	150'	170'	200'
400-I	400	150'	170'	200'
360-I	360	150'	170'	200'
320-I	320	150'	170'	200'
300-H	300	100'	170'	200'
275-E	275	65'	110'	140'
240-H	240	100'	170'	200'
240-G	240	100'	170'	200'
225-I	225	150'	170'	200'
160-D	160	110'	140'	140'
160-H	160	100'	170'	200'
160-F	160	80'	170'	200'
150-X	150	BULK LIMITS NOT APPLICABLE		
140-X	160	100'	170'	200'
130-G	130	80'	170'	200'
105-A	105	40'	110'	125'
88-X	88	BULK LIMITS NOT APPLICABLE		
84-E	84	65'	110'	140'
65-D-2	65	40'	110'	140'
65-A	65	40'	110'	125'
05		CONFORMITY WITH OBJECTIVES, PRINCIPLES AND POLICIES OF THE MASTER PLAN.		

FIGURE 14: EXISTING PLANNING CODE HEIGHT AND BULK DISTRICTS

in which the maximum permitted height is 450 ft. Above a height of 150 ft., the maximum permitted building length is 170 ft., and the maximum permitted diagonal dimension is 200 ft.

No off-street parking is required in the C-3-O district; however, a maximum of 7% of the gross floor area may be allocated for parking.

B. URBAN DESIGN AND VISUAL ASPECTS

ARCHITECTURAL RESOURCES

Two of the 3 buildings on the project site are noted in the parcel-by-parcel citywide inventory of architecturally significant buildings conducted by the Department of City Planning (Map titled 1976 Architectural Inventory) in 1974, 1975, and 1976 (see Appendix A, p. 137). The 2-story building at 280 Battery St. (Lot 15, Block 237) is rated "1", and the 6-story building at 353 Sacramento St. (Lot 16, Block 237) is rated "0". The ratings of "0" and "1" are the lowest in the Inventory scale of "0" to "5".

The Foundation for San Francisco's Architectural Heritage has completed an architectural survey and historic resources inventory (The Foundation for San Francisco's Architectural Heritage, 1979, Splendid Survivors, San Francisco's Downtown Architectural Heritage) rating all downtown buildings from "A" to "D" (see Appendix B, p. 138). The 2 buildings on the project site which are included in the 1976 Architectural Inventory of the Department of City Planning are rated as "B" in the Heritage survey, a rating which indicates an "important landmark of National Register quality . . . eligible for the State Inventory (of Architectural Resources) and possibly City landmark status". See Figure 15 for the locations of the buildings on the block which are included in the 1976 Architectural Inventory and the Heritage Architectural Survey.

The building at 280 Battery St. was built in 1908 for the White Investment Company. It was designed by Lewis P. Hobart, a well known San Francisco architect. It is a brick building with concrete supports, and is surfaced

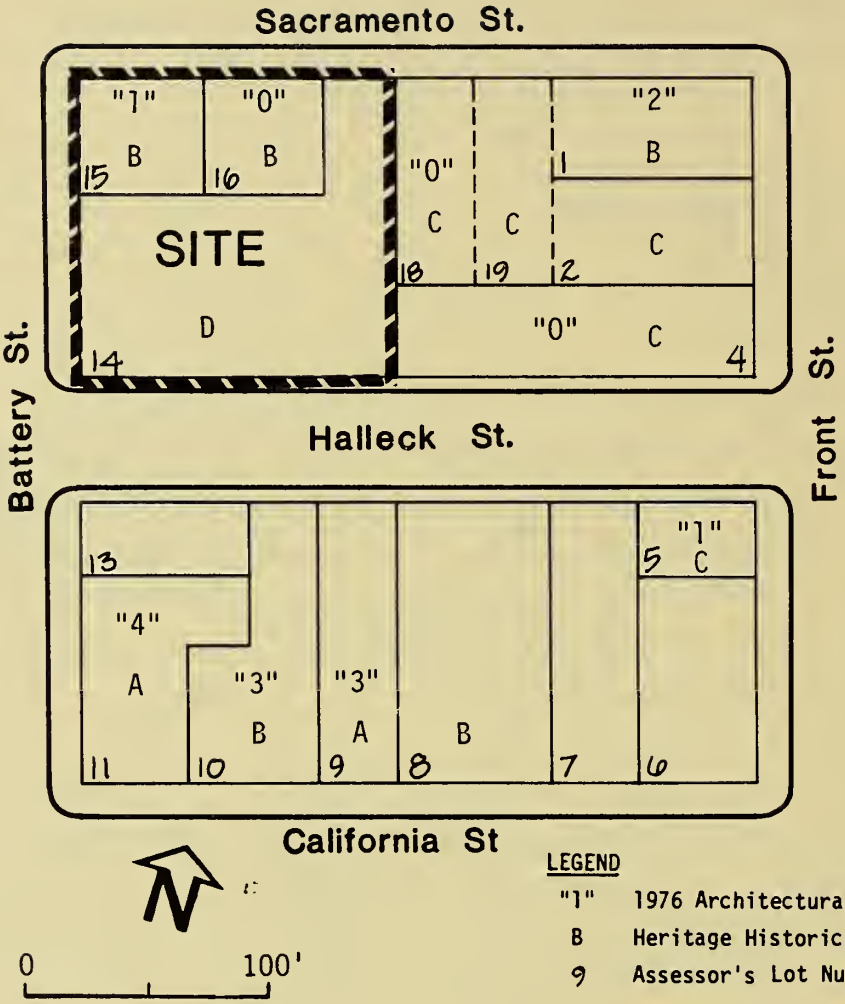


FIGURE 15: ARCHITECTURAL RESOURCE RATINGS AND LOT NUMBERS

with stucco, stone and metal. A shell and fish molding decorates the frieze and a large cartouche is above the cornice at the building entrance./1/ Store-front alterations, the tiling over of a part of the frieze, and flat and overhanging signs have modified the harmony of the original design.

The 6-story building at 353 Sacramento St. was built in 1922 for H. & W. Pierce, Inc. It was designed by B. G. McDougall. It has a steel frame and reinforced concrete floors and roof, and a gray brick curtain wall facade. The original appearance of the building, including the entrance to the office lobby, has remained intact.

The "D"-rated 2-story building at 248 Battery St., designed by B.G. McDougall, was built in 1920. It also fronts on Halleck St. and on Sacramento St. at Nos. 335-337. The building is a brick structure with wood posts.

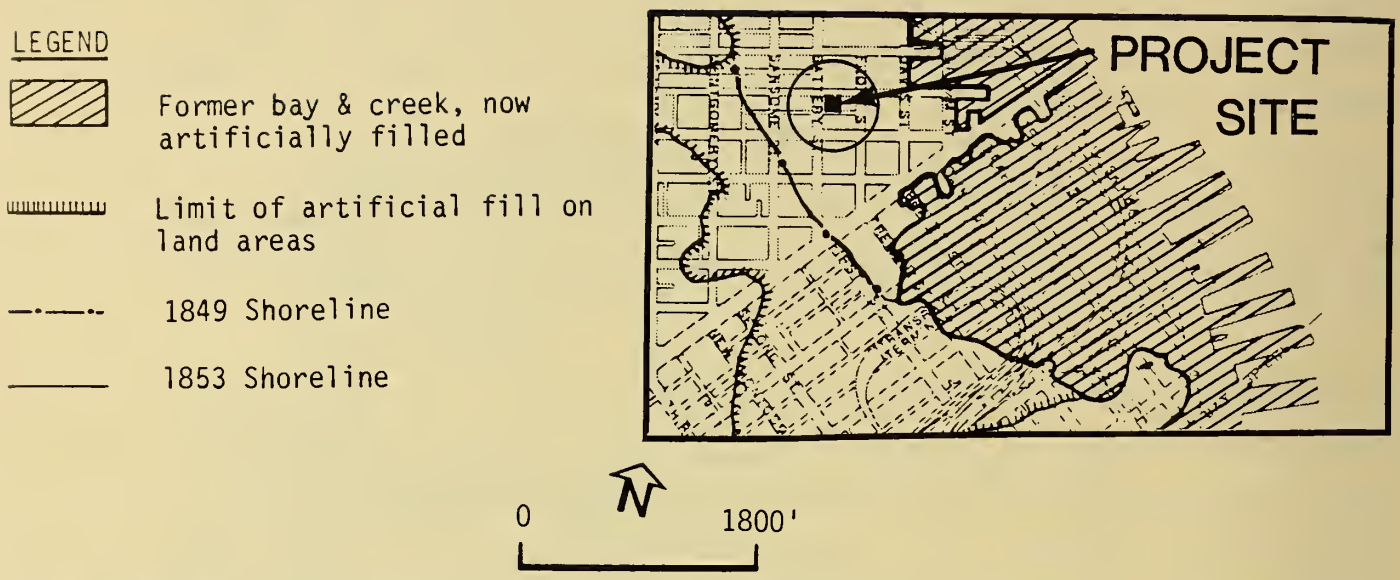
One Embacadero Center, oposite the site on Sacramento St., was not rated in the Heritage survey. The old Federal Reserve Bank, diagonally opposite the site at the northwest corner of Battery and Sacramento Sts. was rated "B". The building at 241 Battery St., opposite the site, was also rated "B". The building at the northwest corner of Battery and California Sts. was not rated by Heritage.

NOTE - Urban Design and Visual Aspects

/1/ A frieze is a sculptured or ornamental band on a building; a cartouche is an oval or oblong figure. A cornice is a projecting horizontal member or top course that crowns an architectural wall.

C. CULTURAL AND HISTORIC ASPECTS

The project site was once part of Yerba Buena Cove, a bight used for anchorage of occasional ships in the early 19th century, and the anchorage place for hundreds of ships in the Gold Rush. A map of San Francisco dated 1849-50 shows the original shoreline crossing California St. on the west side of Sansome St. and Halleck and Sacramento Sts. at Leidesdorff St (San Francisco in 1849-50, Map F869.53, 1849-50; B2, Bancroft Library, University of California at Berkeley). The California St. Wharf extended eastward from Sansome St. to approximately Battery St. Filling of the cove was rapid following the gold rush of 1849. The U.S. Coast Survey of 1853 shows the project site and the area in its vicinity completely filled to what is now The Embarcadero (see Figure 16).



Source - Schlocker, J., 1974, Geology of the San Francisco North Quadrangle, California, Professional Paper 782, USGS, Washington, D.C.

FIGURE 16: SHORELINE OF SAN FRANCISCO IN 1849, 1853, and 1979

Many ships which were anchored in the cove during the early months of the gold rush were abandoned for shipping purposes and were converted to stores and hotels. Some of the later fill covered some of the ships which had been dismantled and broken up. A map prepared by, and on file at, the San Francisco Maritime Museum shows 1 such ship east of the project site at the southwest corner of Sacramento and Front Sts. but none on the project site (Gold Rush Vessels Beached, Scuttled and Broken Up, 1963, San Francisco Maritime Museum). The ship was the Thomas Bennett, which was used as a storeship and grocery store before the block was completely filled in.

Early buildings on the project site were damaged or destroyed in the 1906 earthquake and fire; rebuilding on the project site occurred between 1908 and 1922 (see Section III.B, p. 23, for a description of the buildings presently on the site).

D. COMMUNITY SERVICES AND UTILITIES

(See the end of this section for a list of persons from whom information has been obtained.)

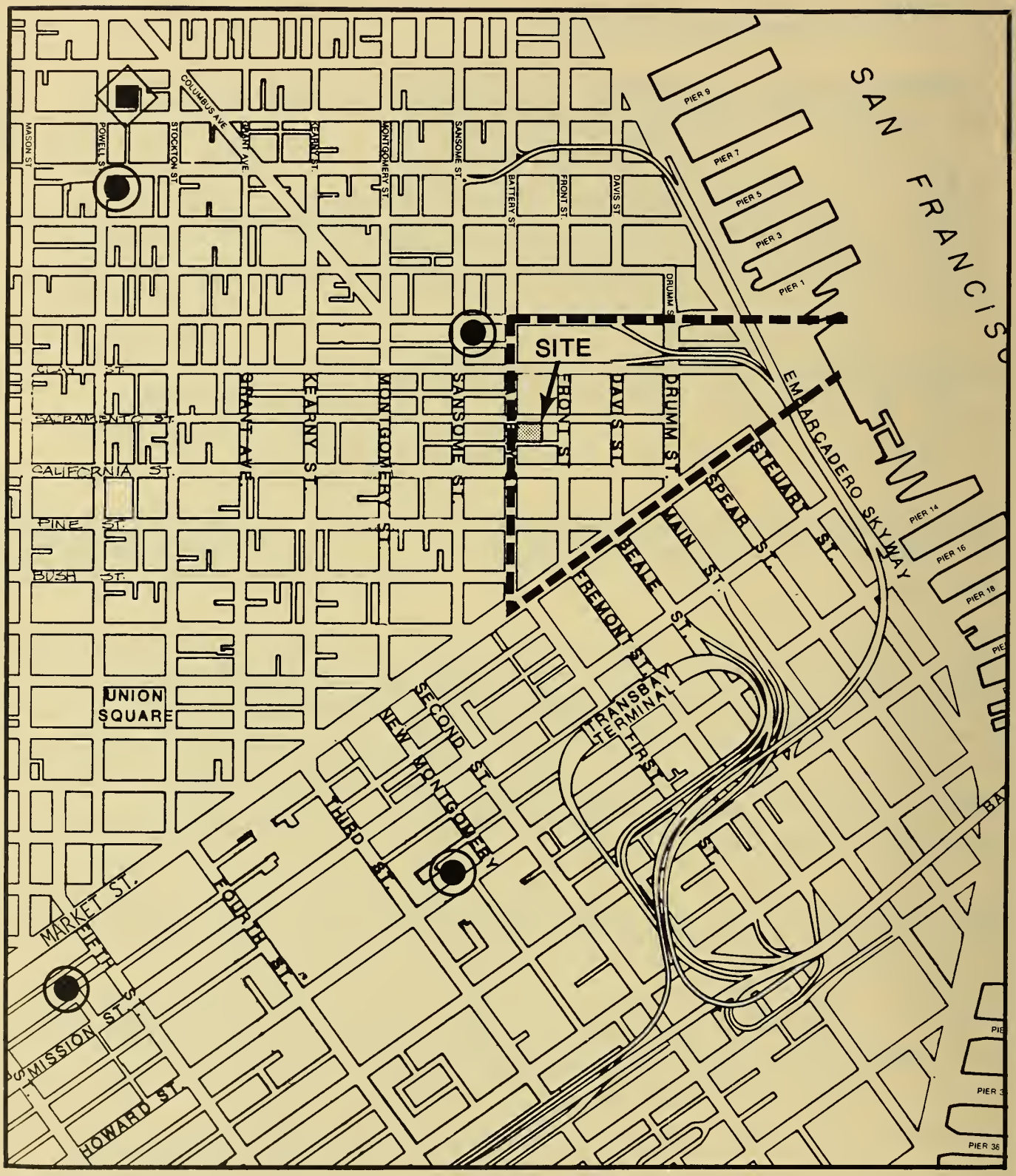
Police. The project site is located in Reporting Area 344 in the San Francisco Police Department's Central District (see Figure 17). A police car patrols the project vicinity 24 hours a day; there are no foot patrols in the area./1/

Reporting Area 344 logged a total of 700 incidents, including 38 violent crimes, in 1978. Auto-related thefts account for 50% of all reported thefts in the area./2/ Data indicate a 7% crime increase from 1977 to 1978.

Fire. The San Francisco Fire Department provides fire protection services. All companies of first response (see Figure 17) respond to the vicinity of the site within 4 minutes./3/

Water. Water is provided for San Francisco from the Hetch Hetchy and San Francisco Water Department system via the Crystal Springs and San Andreas Reservoirs located on the San Francisco Peninsula. The project area is served by the 141-million gallon capacity University Mound Reservoir. Eight-inch diameter water mains serve the site from Battery St. and 6-inch diameter mains serve the site from Sacramento St./4/

Sewer. The Bureau of Sanitary Engineering of the Department of Public Works provides combined storm and sanitary sewer service for San Francisco. Wastewater from the site currently flows into a 12-inch diameter main under Battery St. connecting to an 18-inch main under Sacramento St./5/ The North Point Water Pollution Control Plant receives dry and wet weather flows from the project area. Storm flows resulting from rainfall in excess of approximately 0.02 inches per hour exceed the design capacity of the plant and are discharged directly into the Bay. Projects to reduce these overflows are currently under design and construction./6/



LEGEND

- DAON BUILDING SITE
- CENTRAL POLICE STATION
- POLICE STATISTICAL REPORTING AREA 344
- FIRE STATIONS - FIRST ALARM RESPONSE

FIGURE 17: POLICE AND FIRE STATIONS SERVING THE PROJECT SITE

Solid Waste. Domestic solid wastes are collected from the site by the Golden Gate Disposal Company. Wastes are taken to a transfer station north of Brisbane and then transported to a landfill site at the Mountain View Shoreline Regional Park. The current contract provides for use by the City through 1983./7/

Telephone. Full telephone service is provided to the site by Pacific Telephone and Telegraph (PT&T) Company through an underground system./8/

NOTES - Community Services and Utilities

/1/ Captain G. D'Arcy, Commanding Officer Central District Station, Police Department, letter communication, 16 February 1979. This letter is available for public review at the Department of City Planning, Office of Environmental Review.

/2/ Officer J. Farrell, Crime Analysis Division, Police Department, telephone communication, 15 March 1979.

/3/ Chief W. Graham, Fire Marshal, Fire Department, letter communication, 12 February 1979. This letter is available for public review at the Department of City Planning, Office of Environmental Review.

/4/ J. Kenck, Manager, City Distribution Division, Water Department, letter communication, 26 February 1979. This letter is available for public review at the Department of City Planning, Office of Environmental Review.

/5/ J. Walsh, Investigation Section, Bureau of Sanitary Engineering, telephone communication, 20 March 1979.

/6/ M. Francies, Investigation Section, Bureau of Sanitary Engineering, telephone communication, 21 February 1979.

/7/ F. Garbarino, Office Manager, Golden Gate Disposal Company, telephone communication, 20 April 1979.

/8/ W. Ottens, Engineer, Pacific Telephone and Telegraph Company, telephone communication, 8 March 1979.

E. ECONOMIC ASPECTS

BLOCK 237, THE PROJECT SITE

Office and Retail Space. The project site presently contains 11 commercial establishments, occupying about 36,200 net sq. ft. in 3 structures ranging

from 2 to 6 stories. All buildings are fully occupied; an additional 3,900 net sq. ft. of space is partially used for storage. Annual average rents on the site range from $12 to $15 per ft. for retail space and $8 to $10 per sq. ft. for office space. See Appendix D, Table D-1, p. 151, for a detailed list of current occupancy. In summary, usage is as shown in Table 3.

TABLE 3: EXISTING NET LEASABLE COMMERCIAL FLOOR AREA AT THE PROJECT SITE (Square Feet)

	240-248 Battery St.* (Lot 14)	280 Battery St. (Lot 15)	353 Sacramento St. (Lot 16)	Total	Percent
Office	11,700	2,500	11,700	25,900	72
Retail/ Restaurant	10,000**	300	0	10,300	28
	21,700	2,800	11,700	36,200***	100

* Includes 335-337 Sacramento st.
** Includes 3000 sq. ft. of ground-level retail space temporarily in office use.
***3,900 sq. ft. of basement storage space not included.

SOURCE: M and T Properties

Employment and Tenant Mix. Business establishments at the project site provide employment for about 250 persons. The majority (about 73%) are employed by M. Arthur Gensler, Jr. and Associates, an architectural firm. Other office tenants include 3 real estate companies and 2 law firms, employing a total of about 27 persons. Four ground-floor retail and restaurant establishments, including Stone Soup, employ an estimated 34 persons. (See Appendix D, Table D-1, p. 151, central columns).

Fiscal: Existing Assessed Valuation and Property Taxes (Block 237). The 1979-80 assessed value of the 3 parcels in Block 237 which constitute the project site totals about $385,600; $251,500 is in land value and $134,100 is in improvements. At the 1979-80 composite tax rate of $4.97 per $100 assessed value, the site will generate $19,100 in property taxes this fiscal year. These revenues will be distributed as shown in Appendix E, Table E-1, p. 156.

Fiscal: Other Costs and Revenues. Based on the average gross receipts of $100 per net sq. ft. for retail/restaurant space/1/, the existing 10,300 net sq. ft. of retail uses in the block generated an estimated $66,700 in 1978-79 in sales tax revenues (6.5% of about $1 million in gross receipts): the State received about $48,700; the City and County of San Francisco, $12,700; and BART, $5,300. The estimated 1978-79 revenues from payroll expense or business taxes were on the order of $22,300./2/

Fiscal: Existing Costs and Net Revenue. The City and County currently incurs some costs to provide services to the site, such as fire and police protection, street lighting and cleaning, and street and storm drain maintenance. According to R. Evans, the Assistant Director of the Department of Public Works, these costs cannot be reliably quantified for individual office sites in San Francisco./3/ Revenues generated to the City and County from the site to offset costs include property tax ($16,300), sales tax ($12,700) and business or payroll tax ($22,600), less public expenditures, are estimated to exceed service costs.

DOWNTOWN AND REGIONAL SETTING

Existing and Proposed Office Space, Downtown Business District. San Francisco has about 56 million gross sq. ft. of office space./4/ Almost half of this space is in 62 major office buildings, with a height of 10 stories (118 ft.) or more, built in the Downtown business district in the 32-year period since 1948. About half of the total post-World War II high-rise office space, 15 million sq. ft. out of 28 million sq. ft., was constructed from 1970 through 1979 in 23 structures; another 1 million sq. ft. of high-rise office space will be completed by the end of 1980 in 4 structures. Eight additional office buildings are under construction now, and another 4 buildings, including the project, have been formally applied for or are expected to be proposed and are in the process of environmental impact report preparation. If all were to be constructed, these 12 buildings would add about 7.6 million gross sq. ft. to existing Downtown high-rise office space, an increase of 26% over existing high-rise office space including the 1 million sq. ft. to be completed in 1980, and an increase of 14% over total existing office space (see Appendix E, Table E-2, p. 157).

Vacancy Rates and Absorption. A shortage of office space currently exists in San Francisco. As of mid-1978, the office vacancy rate of 8.9% citywide/5/ and about 1.0% in new Downtown high-rise buildings built from 1970-77/5/ was among the lowest in the nation. It is expected that the buildings now under construction and due for completion in 1980 will be readily rented due to existing demand./7/ The majority of the space is to be leased on the open market. One effect of the office space shortage in San Francisco has been to stimulate office development elsewhere in the Bay Area. San Mateo and Contra Costa Counties, in particular, are experiencing demand not only from expanding local businesses, but also from San Francisco relocations./8/

Rents./9/ Office rents have increased sharply in the past 2 years as the demand for office space has exceeded the City and regional supply, and as land and energy costs have escalated. High-quality, new space leases for $12 to $25 per sq. ft. annually. Somewhat older Downtown buildings lease for $11 to $12 per sq. ft. annually. In contrast, San Francisco offices not located Downtown and offices in the suburbs lease for $7 to $9, and rents in unrenovated pre-World War II buildings are around $6 per sq. ft. annually. If renovated, pre-war buildings rent at $8 to $9 per sq. ft.

NOTES - Economic Aspects

/1/ C. Nicholas, Former Director of Retail Leasing, Cushman and Wakefield, telephone communication, 19 April 1979.

/2/ An explanation of San Francisco's business taxes excerpted from San Francisco Planning and Urban Renewal Association, June, 1975, Detailed Findings; Impact of Intensive, High-Rise Development in San Francisco, Final Report, p. 146-147, is available at the Office of Environmental Review, Department of City Planning. The payroll tax rate is now 1.1%. Banks and insurance companies are exempt. The estimated business tax revenue of $22,600 is based on $21,600 from payroll expense tax and $1,000 from gross receipts tax. Assumptions:

Payroll Expense Tax: 218 office employees (many self-employed) at an estimated average salary of $15,000 for total office payroll of $3.3 million; 60% eligible for tax, tax rate of 1.1%.

Gross Receipts Tax: $1.5 million gross receipts in retail/restaurant space; tax rate of $1 per $1,000 (Class 08).

/3/ R. Evans, Assistant Director of Public Works, telephone communication, 27 April 1979.

/4/ The 56 million sq. ft. estimate of existing inventory is based upon the 50 million sq. ft. enumerated in a 1974 SPUR-sponsored survey (made as background for the analysis of high-rise development cited in Note 2) plus the 6 million sq. ft. of high-rise office space in 9 buildings completed from 1976 to 1977.

/5/ Security Pacific Bank, 30 June 1978, Northern Coastal Monthly Summary of Business Conditions. The article states that 1.3 million sq. ft. came on line in 1977, of which a large proportion is already occupied. A copy of this article is available for public review at the Department of City Planning, Office of Environmental Review.

/6/ N. Spencer, Senior Sales Consultant, Coldwell Banker, personal communication, 29 November 1978.

/7/ Security Pacific Bank, op. cit.

/8/ N. Spencer, Senior Sales Consultant, Coldwell Banker, telephone communication, 7 May 1979, and J. Weil, Leasing Agent, Grubb and Ellis, telephone communication, 8 May 1979.

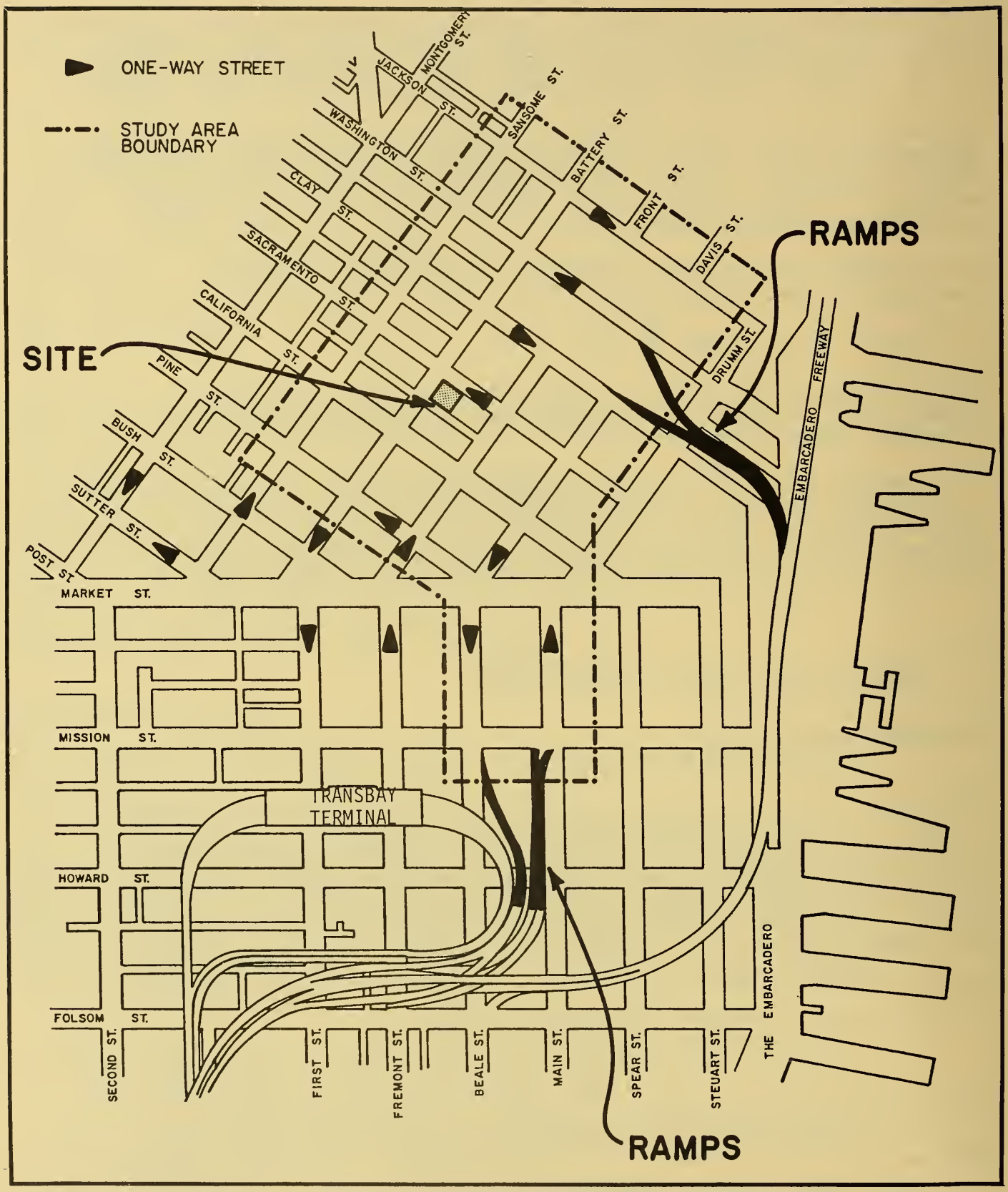
/9/ Information in this paragraph is based upon telephone communications with D. Bixby, Vice President, Milton Meyer & Co., 12 October 1978, with N. Spencer, Senior Sales Consultant, Coldwell Banker, 16 October 1978, and upon a personal communication with J. Stanisch, Senior Real Property Appraiser, Assessor's Office, City and County of San Francisco, 17 October 1978.

F. TRANSPORTATION, CIRCULATION AND PARKING

STREET AND FREEWAY SYSTEM

The site is served by a grid of local streets and by portions of the regional freeway system (see Figure 18). Access to the freeways connecting with the East Bay, San Francisco International Airport, and Peninsula is provided by pairs of ramps 800 ft. northeast of the project site and 1,500 ft. south of the site. The intersection of Battery and Sacramento Sts., adjacent to the site, is controlled by a traffic signal. Halleck St. at Battery St. is not controlled by any standard traffic control device.

The site is within the Downtown Core automobile control area designated in the Transportation Plan for Downtown and Vicinity (San Francisco Planning Commission, Resolution 6834, 27 April 1972, Map A). This area is described in the Plan as "that intensely populated area which functions as a financial, administrative, shopping and entertainment center where priority must be given



SOURCE: TJKM

FIGURE 18: STREET SYSTEM AND FREEWAY RAMPS

to the efficient and pleasant movement of business clients, shoppers and visitors; where a continuing effort should be made to improve pedestrian, transit and service vehicle access and circulation; where priority for the use of limited street and parking space within this core should be available for these functions; and where a continuing effort should be made to reduce the impact of the private commuter vehicle." The Revisions to the Transportation Element of the Master Plan Regarding Parking (City Planning Commission Resolution 7647, 20 January 1977), confirm the statement in the Plan for Transportation (1972) that "all additions to the commuter load as a result in job growth in the City should be made by public transit." In accordance with this statement, objectives and policies guiding and limiting the provision of parking are outlined in the revisions to the Downtown Transportation Plan and the Plan for Transportation.

Existing traffic volumes on nearby streets are shown in Table 4. A capacity analysis shows the intersections of Battery St. at Washington St. and Clay St. at Front St. and the Mission St. intersections with Main St. and Beale St. to be operating at Level of Service C or better. See Appendix F, Table F-1, p. 159, for definitions and volume-capacity ratios for each Level of Service, as well as an explanation of the capacity analysis. Table 5 shows the peak-hour volume-to-capacity ratios and the most heavily used approach to each intersection.

TABLE 4: 1978 VEHICLE TRAFFIC VOLUMES IN THE VICINITY OF PROJECT SITE

Street	Section	24 Hour	Peak Hour*	Max. 8 Hours
Beale	Market to Mission	8,000	980	4,800
Main	Mission to Market	13,400	1,520	7,980
Clay	Front to Davis	29,200	2,290	16,370
Washington	Off-ramp to Battery	15,600	1,970	9,380
Battery	Commercial to Sacramento	14,700	1,420	8,510

*The peak period is between 4:00 and 6:00 p.m., with the exception of Washington and Main Sts. where the peak period is between 7:00 and 9:00 a.m. The peak hour is the 1-hour during the peak period when traffic volumes are greatest.

SOURCE: See Appendix F., p. 158.

TABLE 5: 1978/1979 PEAK-HOUR VOLUME-TO-CAPACITY RATIO SUMMARY AT INTERSECTIONS IN THE VICINITY OF PROJECT SITE

Intersection	Service Volumes (V/L/H)* Existing	Level of Service E**	v/c*** Ratio	Critical Approach (Direction)
Clay and Front	750	1,320	0.57	Eastbound
Battery and Washington	788	1,100	0.72	Westbound
Mission and Beale	905	1,320	0.69	Eastbound
Mission and Main	940	1,320	0.71	Northbound

*Vehicle per lane per hour.
**Level of Service E is defined as "flow is unstable; there may be momentary stoppages".
***v/c is the existing volume/service volume ratio at Level of Service E.

SOURCE: See Appendix F., p. 158, and Table F-1, p. 159.

PARKING AVAILABILITY

A survey of existing long-term (greater than 6 hours), commercially available, off-street parking in the area bounded by The Embarcadero, Jackson St., Sansome St., and Market St. was made on the afternoons of Thursday and Monday, 1 and 5 June 1978 and Wednesday and Thursday, 20 and 28 September 1978 (see Figure 19). In this area there are 3,800 long-term, commercially available spaces of which 570 spaces are vacant on a daily basis. This is equivalent to an average occupancy of approximately 85%. There is no off-street parking on the site.

There is a commercial/loading zone on the south side of Sacramento St. adjacent to the project site. The north side of Sacramento St. has 4 parking meters near its intersection with Battery St., the rest of the block is a passenger loading zone. Battery St. adjacent to the project site has 2 parking meters on the east side and 5 meters on the west side, all of which are for commercial/loading until 1:00 p.m. The remainder of Battery St.

between Sacramento and Halleck Sts. is a commercial/loading zone. The west side of Battery St. and both sides of Sacramento St. are towaway zones from 4:00 p.m. to 6:00 p.m. No parking is allowed on Halleck St.

PEDESTRIAN SETTING

The pedestrian flows on the sidewalks serving the project site were measured during the peak periods of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. on Wednesday and Friday, 28 and 30 March 1979. The Level of Service of operation for each of the sidewalks was calculated and is presented in Table 6. An explanation of the Level of Service scale is given in Appendix F, Table F-2, p. 160.

TABLE 6: 1979 WEEKDAY, 15-MINUTE PEAK PEDESTRIAN VOLUMES AT THE PROJECT SITE

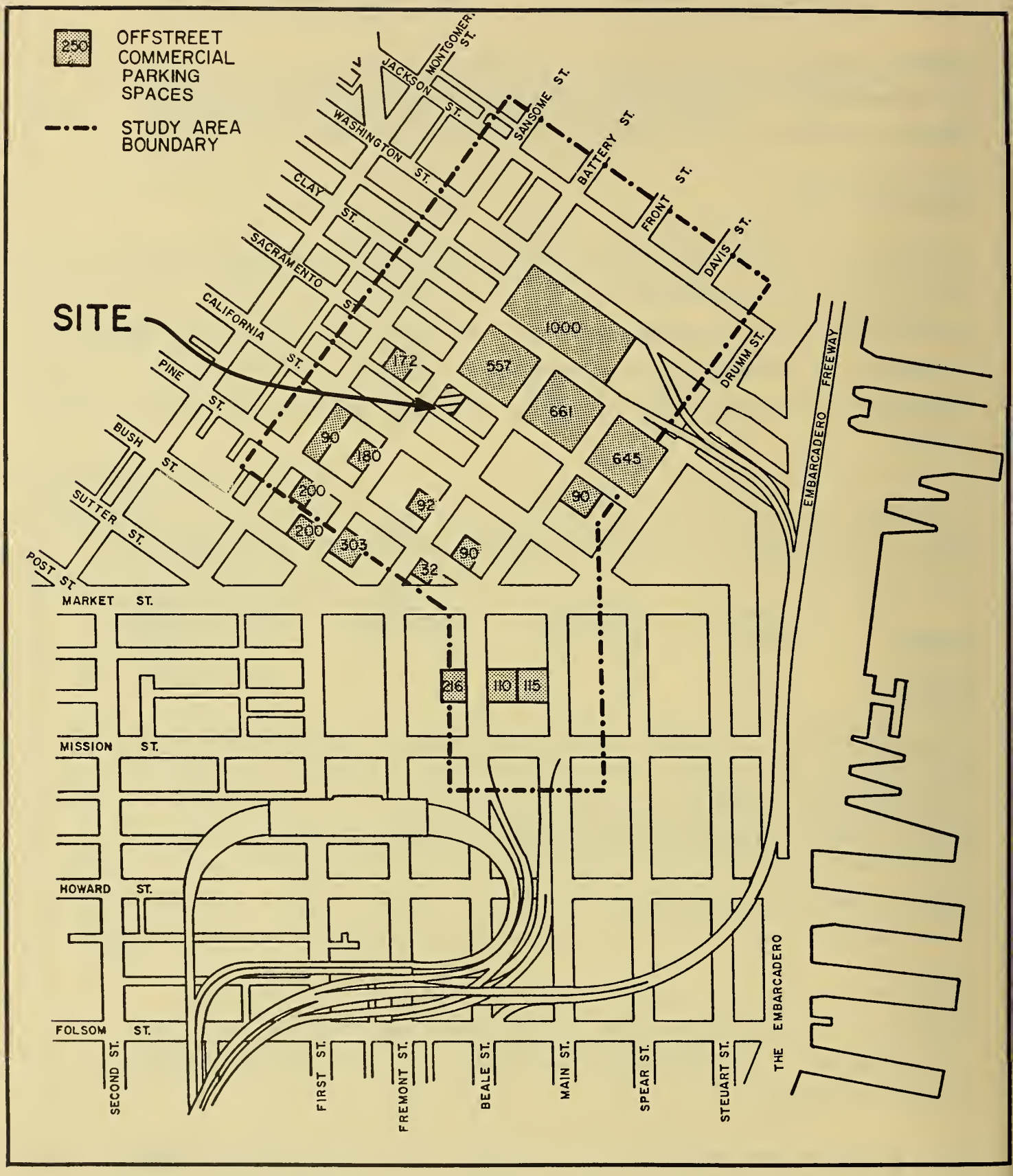
Sidewalk	Effective Width*	Volume**		Rate***		Level of Service+	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Battery	10 ft.	370	330	2	2	A	A
Sacramento	5 ft.	80	80	1	1	A	A

*Effective widths take account of poles, planter boxes, people standing at store windows, etc.
**Pedestrians per 15 minutes.
***Pedestrians per foot of sidewalk width per minute.
+Level of Service is measured at mid-block. For definition of Levels of Service, see Appendix F, Table F-2, p. 160.

SOURCE: TJKM, Traffic Engineers.

During the peak periods, pedestrian activity around the site is directed primarily from transit and parking facilities in the morning and toward them in the afternoon. The sidewalks on the project site are currently operating at Level of Service A.

The crosswalk volumes were measured during the same time periods the sidewalk analysis was conducted. The southern crosswalk across Battery St. was



SOURCE: TJKM

FIGURE 19: PARKING SURVEY BOUNDARIES AND RESULTS

observed to carry 340 persons per hour during the morning peak and 350 persons per hour during the afternoon peak. The eastern crosswalk across Sacramento St. was observed to carry 1,040 persons and 1,070 persons per hour during the morning and afternoon peaks, respectively. The average pedestrian queue observed in the morning was 5 persons with a maximum of 11. The average afternoon queue was 8 persons with a maximum of 13. Many people were observed to cross both streets illegally.

TRANSIT SERVICE

The project site is served directly by 3 Muni electric trolley and motor coach lines providing radial service to and from the Downtown area, by the 5 light-rail vehicle lines (Muni Metro) which are expected to serve the Embarcadero Station effective in 1980, and by the California St. cable car line. Regional service is provided to the East Bay by the Bay Area Rapid Transit District (BART) from the Embarcadero Station, and by A-C Transit motor coaches from the Bay Bridge Transit Terminal on Mission St. between Fremont and First Sts. BART is planning to increase service before 1982 by operating directly between Richmond and Daly City (W. Belding, Senior Economics Analyst, BART, telephone communications, 17 October 1978).

Service to the Peninsula is provided by the Southern Pacific Transportation Company from a train terminal at Fourth and Townsend Sts., by the San Mateo County Transit District (SamTrans) which has bus routes and stops along various streets in the area, primarily on Mission St. west of First St., and by BART which effects transfers to SamTrans routes at the Daly City Station. The Golden Gate Bridge, Highway and Transportation District (Golden Gate Transit) provides peak-period service to Marin and Sonoma counties from stops on Battery St. and on Sansome St. 1 block west of the site, and ferry service to terminals in Larkspur and Sausalito from the Ferry Building. The Tiburon Ferry Service, operated by Harbor Carriers, Inc., also terminates at the Ferry Building.

Although not traditionally considered as transit, car pooling is becoming a substantial form of para-transit. Golden Gate Transit operates a van-pooling

program to areas not sufficiently close to the existing routes. The RIDES van- and car-pooling programs, operated under the auspices of a nonprofit, publicly funded corporation, provides consulting and matching services to help establish Bay Area van and car pools.

Muni and BART exceed their seated capacities during peak hours, but operate at less than 100% of total capacity (seated and standing) when ridership is averaged over a 1-hour period. During the peak of the peak, when ridership demand is most intense, demand on Muni and BART may exceed the total capacity of the available vehicles. This peak-of-the-peak condition on the Muni varies from line to line. The duration of jammed conditions on the more heavily used lines (J, K, L, M, N, 38, 55) may range from 15 to 30 minutes. The variable duration is caused by variations in day-to-day operating conditions which can cause bunching of transit vehicles. The BART peak-of-the-peak demand is fairly constant over a 30-to-40-minute period during which outbound trains are loaded in excess of seated capacity. Transit agencies other than Muni and BART operate at less than 100% of their seated capacities during a 1-hour peak period. Specific routes, however, were observed to experience peak-of-the-peak loadings in excess of seated capacity for periods of 5 to 30 minutes during the peak hour. Observations were made on Wednesday and Friday, 28 and 30 March 1979 and on Thursday, 5 April 1979. A line-by-line analysis available for public review at the Department of City Planning, Office of Environmental Review was verified by the observed conditions. The afternoon peak is more intense than the morning peak for most agencies. The existing characteristics of transit ridership on lines of each transit agency serving the project site are shown in Table 7.

G. AIR QUALITY

The Bay Area Air Quality Management District (BAAQMD; formerly the Bay Area Air Pollution Control District, BAAPCD) operates an air quality monitoring station approximately 1.5 miles to the southwest of the site. A 3-year summary of the data collected at this station and the corresponding air quality standards appear in Appendix G, Table G-1, p. 166.

TABLE 7: 1978 PEAK HOUR TRANSIT RIDERSHIP AND CAPACITY
(Selected Routes;* Peak Direction Only)

	Riders	Vehicles	Capacity++ Seated	Capacity++ Total	% Occupancy Seated	% Occupancy Total	Peak
San Francisco Muni	13,560	213	10,460	16,670	124	81	p.m.
BART: Transbay	7,600	10**	6,700	10,040	113	76	p.m.
Westbay	5,900	9**	5,540	8,320	106	71	p.m.
A-C Transit	8,590	206	9,890	12,360	87	70	p.m.
SamTrans	610	15	800	980	77	63	p.m.
Southern Pacific RR	4,300	9***	11,000	11,000		39	p.m.
Golden Gate Transit							
Motor Coach	4,480	118	5,310	6,490	84	69	a.m.
Ferry	1,190	3	N.K.+	2,075		57	p.m.
Harbor Carriers, Inc.	345	2	N.K.+	700		49	p.m.

*Muni: J, K, L, M, N, 5, 6, 7, 8, 31, 38, 38LS, 38X, 41, 45, 61, 71, 72; SamTrans: 7F, 7B, 5M, 7R; A-C Transit: A, B, BX, C, CH/CB, E, EX, F, FSG/FX, G, H, K, KH, L, LX, N, NX, Q, QX, R/RH, RD/RF/RCV, S, SW, V, W, Y.
**Number of trains: 10 cars on Concord lines; 7 cars on Fremont line.
***Number of trains assuming 10 cars per train to reflect available rolling stock.
+Not known.
++Capacity has been calculated based on the following per vehicle capacities.

	Seated Passengers	Total Seated and Standing Passengers
Muni: Streetcar	55	95
Trolley	51	75
Motor Coach	48	72
Cable Car	34	76
BART (per car)	72	108
A-C Transit	48	60
SamTrans	53	65
Southern Pacific (per car)	100/150	100/150
Golden Gate Transit Motor Coach	45	55
Sausalito Ferry		575
Larkspur Ferry		750
Harbor Carriers Tiburon Ferry		350

SOURCE: Field observations were made during the peak period on 25, 27 and 28 September 1978, 2 and 4 October 1978, 29 and 30 March 1979, and 5 April 1979, and publicly available data was supplied by the following agencies and personnel on the dates indicated:

Agency	Data	Personnel	Date
Muni	Schedule Checks (Various weekdays; 14 March 1977; 24 and 28 March, 12, 17 and 26 April, 10 May, 26 June, 17 and 31 July, 31 August, 14 September 1978)	A. Figone, Transit Schedule Coordinator	2 October 1978
BART	Data Acquisition System (Tuesday, 18 April 1978)	W. Belding, Senior Economic Analyst	16 October 1978
A-C Transit	"Traffic Survey Series A-50", Institute of Transportation Studies (April 1978)		April 1978
SamTrans	Report of Weekly Operation (22 to 29 September 1978)	L. Stuek, Supervisor of Program Development	12 December 1978
Southern Pacific Railroad	Yearly Account, File Ap-191 (October 1976)	G. Pera, Manager - Commute Traffic	21 July 1977 19 June 1978
Golden Gate Transit	Monthly Reports (July and August 1978)	A. Zahradnik and P. Dyson, Transportation Planners	12 October 1978
Harbor Carriers, Inc.	Daily Reports (Friday, 6 October 1978)	Dispatcher	13 October 1978

San Francisco's air quality is the least degraded among the developed portions of the Bay Area. The prevailing westerly and northwesterly winds tend to carry pollutants from the City to the East Bay and South Bay. Annual fluctuations in air quality are due to a combination of meteorological factors, which vary unpredictably, and pollutant emissions, which have been decreasing in the Bay Area and are expected to continue to do so in the near future. Highest annual pollutant concentrations in San Francisco, while exhibiting alternating fluctuations due to meteorology, have shown an overall improvement during the 1971 - 1978 period. Annual numbers of violations of air quality standards, while exhibiting similar fluctuations, have not shown

any clear overall trend during the same period. In 1978 a total of 10 violations of the ozone, carbon monoxide, nitrogen dioxide, and particulate standards occurred, following a year in which only 1 violation (of the particulate standard) occurred.

The entire Bay Area Air Basin has been designated by the California Air Resources Board as a non-attainment area for ozone (oxidant), carbon monoxide, and particulate (i.e., the standards for these pollutants are now and are expected to continue being violated). A regional Air Quality Plan was recently adopted which establishes control strategies to attain and maintain the standards by 1982 or 1987./1/

NOTE - Air Quality

/1/ Association of Bay Area Governments, BAAQMD, and Metropolitan Transportation Commission, January 1979, 1979 Bay Area Air Quality Plan, San Francisco Bay Area Environmental Management Plan. The Federal Clean Air Act Amendments of 1977 mandate that the ozone and carbon monoxide standards be attained by 1982, although a 5-year extension is possible, and that the particulate standard be attained by 1987.

H. NOISE

As is typical of downtown San Francisco, the noise environment of the site is dominated by vehicular traffic noise. Noise levels were measured for approximately 15 minutes at each of 4 locations near the project site during the afternoon of Thursday, 15 March 1979 (see Figure 20). The results are shown in Table 8, p. 45.

The Environmental Protection Element of the San Francisco Comprehensive Plan (adopted 19 September 1974, p. 17) indicates an L_{dn} of 70 dBA on Battery St., and 65 dBA on Sacramento and Front Sts. in 1974./1/ These figures do not take into account the "urban-canyon" effect. This effect occurs along downtown streets flanked by tall buildings where noise energy can increase due to multiple reflections. Therefore, when the contribution of other streets

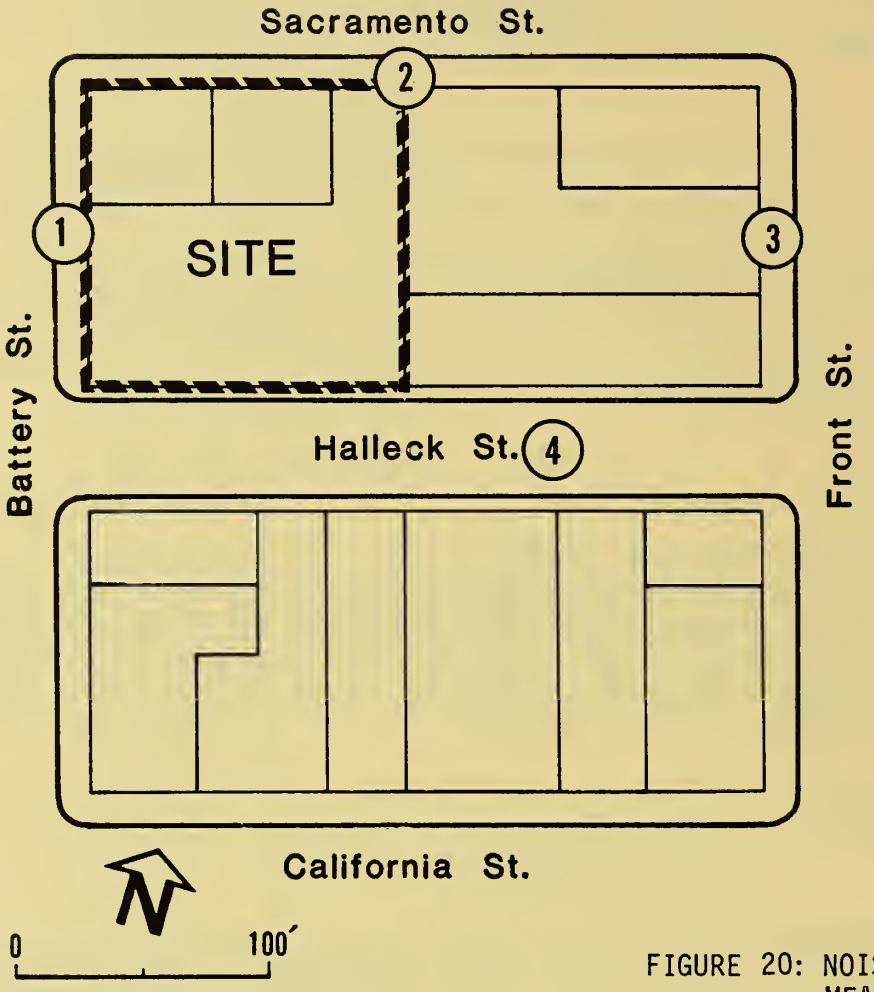


FIGURE 20: NOISE MEASUREMENT LOCATIONS

and the "urban-canyon" effect are accounted for, one would expect a higher L_{dn} noise level; this is borne out by the measurements shown in Table 8, p. 45.

NOTES - Noise

/1/ See footnotes to Table 8 for definitions of L_{dn} and dBA.

TABLE 8: NOISE LEVELS NEAR PROJECT SITE

Location	Measured L_{10}* (dBA***)	Estimated L_{dn}** (dBA***)
1. Battery St., Sacramento-Halleck	81	78
2. Sacramento St., Battery-Front	75	72
3. Front St., Sacramento-Halleck	71	68
4. Halleck St. Battery-Front	67	64

*L_{10} is the noise level exceeded 10% of the time.
**L_{dn}, the day-night average noise level, is a noise measurement based on human reaction to cumulative noise exposure over a 24-hour period, taking into account the greater annoyance of nighttime noises (noise between 10 p.m. and 7 a.m. is weighted 10 dBA higher than daytime noise).
***dBA is the measure of sound in units of decibels (dB). The "A" denotes the A-weighted scale which simulates the response of the human ear to various frequencies of sound.

I. ENERGY

The Pacific Gas and Electric Company (PG&E) furnishes electricity and natural gas to the City of San Francisco. Gas distribution mains and underground electric facilities are used by the existing structures on the site. PG&E obtains a portion of its electrical energy from renewable resources including geothermal and hydrologic power; it will meet new demands for energy primarily by increasing the use of coal, oil, natural gas and nuclear fuels.

J. GEOLOGY, SEISMICITY AND HYDROLOGY

GEOLOGY

The site is located on flat land about 1,800 ft. southwest of San Francisco Bay. The site is 10 ft. above mean sea level; this corresponds to about 1.5 ft. above the San Francisco datum (SFD). Higher land is located to the west at Nob Hill, to the northwest at Telegraph Hill and to the southeast at Rincon Hill.

Before 1850, the site was underwater within Yerba Buena Cove of San Francisco Bay. The cove was then filled with dune sand, silt, clay, rock waste from excavations, organic material and garbage. By 1852, the site was dry land near sea level. Between 1870 and 1875, a sea wall was constructed to the east of the site to protect the landfill.

Although a site-specific soils investigation has not been done, typical profiles in the area indicate approximately 200 to 250 ft. of non-rock sediments above bedrock, which is composed of the Franciscan formation./1/ The profile might include an upper layer of fill and Bay mud about 50 ft. deep, underlain by 150 to 200 ft. of dense clays and sand.

The above figures are approximate; the geologic units are not of uniform thickness. Because the soft Bay mud and artificial fill are compressible and unstable, the materials are unsuitable as a foundation base. Thus, all large buildings in the vicinity are supported by piles driven into the next layer of geologic material, the dense clayey sand. The underlying old Bay clays are stiff (non-plastic) and capable of bearing heavy loads.

SEISMICITY

No active faults (faults which have a historic record or other geophysical evidence of movement within approximately the last 10,000 years) are known to exist within San Francisco. As a deep sediment layer covers the site, it is not known whether any inactive faults are concealed beneath the site. Several

nearby active faults affect San Francisco. These are the San Andreas Fault, located about 10 miles southwest of the site; the Hayward Fault, about 15 miles to the east; and the Calaveras Fault, about 30 miles to the east (see Figure 21). Other active faults which have not been detected may exist in the area.

Both the San Andreas and the Hayward Faults have a recent history of major and minor movements. Large and small earthquakes can be expected in this region in the future. Within the next 60 to 170 years (estimates of recurrence intervals vary), at least 1 earthquake of the magnitude of the 1906 San Francisco earthquake (about 8.3 on the Richter scale of magnitude, a logarithmic scale developed to measure earthquake magnitude by the energy released), and several earthquakes comparable to the 1957 Daly City earthquake (Richter 5.3) can be expected to affect the proposed building.

According to John A. Blume's San Francisco Seismic Safety Investigation, Geologic Evaluation (1974), potential earthquake hazards on the project site include "violent" ground shaking (defined as causing a fairly general collapse of brick and frame structures when not unusually strong, serious cracking of better buildings, lateral displacement of streets, and ground fissuring), liquefaction (the transformation of granular material, such as loose wet sand, into a fluid-like state similar to quicksand) with resultant lateral ground slippage and bearing capacity failure, and subsidence (the sinking of the land surface due to settling of compressible soils).

HYDROLOGY

No water bodies, springs or water courses are located on the site, as it is currently occupied with structures. The site is low-lying and under natural drainage conditions would receive the runoff from the surrounding areas to the north and west. Surface runoff is generally greatest during the wet-weather November through April period.

The project site is located within the estimated run-up area of a 500-year tsunami (a series of sea waves created by an earthquake, a coastal or submarine landslide or volcanic eruption at some distance from the point of

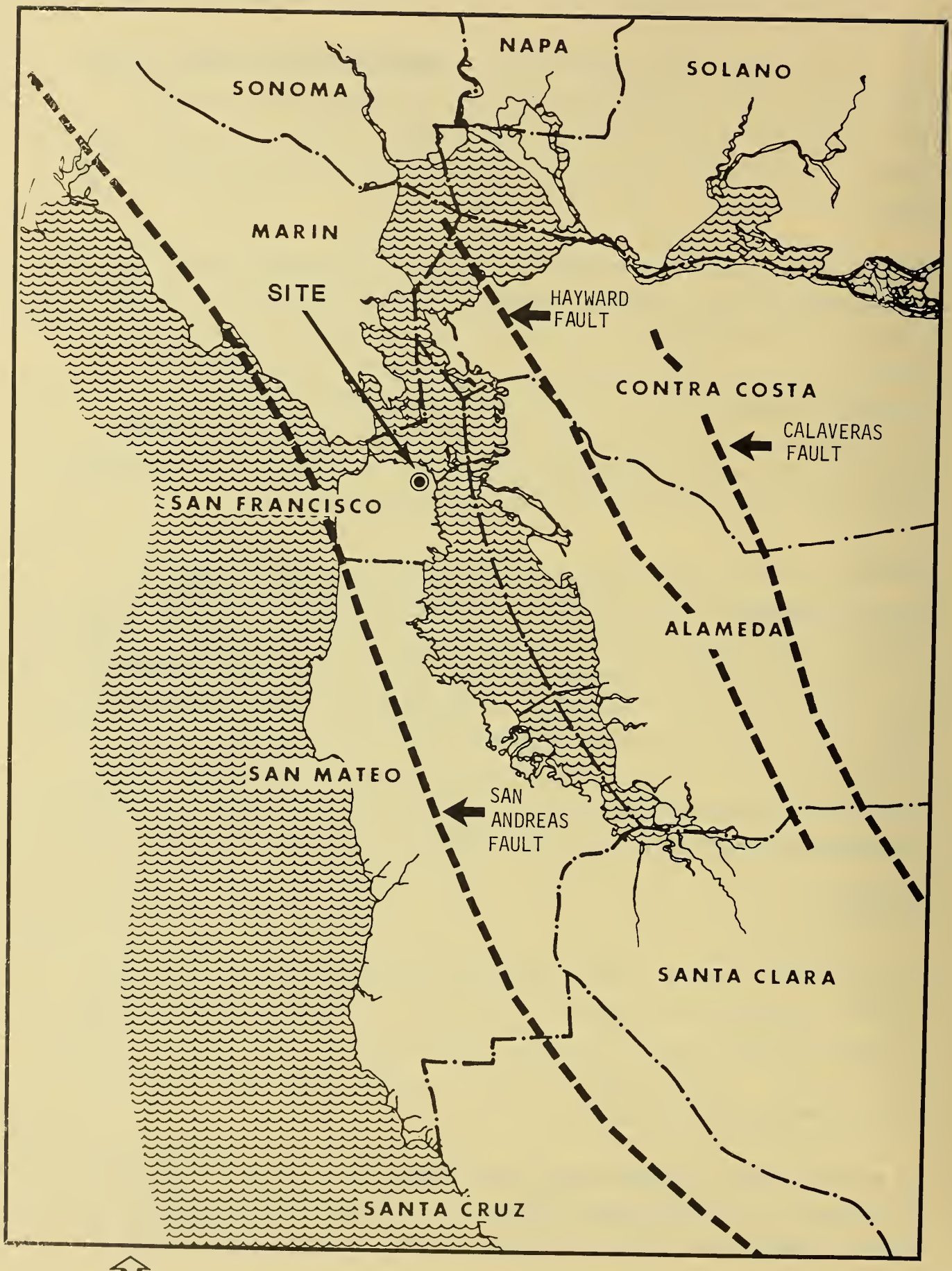


FIGURE 21: MAJOR ACTIVE FAULTS IN SAN FRANCISCO BAY AREA

run-up, with a probability of occurring once in 500 years). Assuming a 20-ft.-high run-up at the Golden Gate, the 500-year tsunami would cover areas at the site to a height of 10 ft. above mean sea level. Since the base of the site is at 10 ft. above mean sea level, the basements and ground floors of the existing structures might be subject to water damage. The 100-year tsunami might also inundate the site./2/

The groundwater level in the upper fill material is below mean sea level (-8.6 ft. SFD). The groundwater level in the sands below the Bay mud has fluctuated over the past few years due to dewatering for construction. The water level in the sands is believed to be rising again to mean sea level./3/

NOTES - Geology, Seismicity and Hydrology

/1/ Franciscan rocks are typical of the northern California Coast Ranges and underlie the hills of San Francisco. They consist of a mixture of dark colored muddy sediments, red, green and brown cherts and lava flows of black basalt, all material laid down on the floor of the Pacific Ocean about 100 million years ago. Cherts are rocks formed by deposits of silica containing microorganisms, which are transformed into hard, waxy or porcelain-like rocks. Franciscan rocks are also known as Franciscan Formation Assemblage. See Roadside Geology of Northern California, David D. Alt and Donald H. Hyndman, Mountain Press Publishing Company, Missoula, Montana, 1975.

/2/ Garcia, A.W., and J.R. Houston, 1975, Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound, Technical Report H-75-17, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, 39180.

/3/ Dames and Moore, 1974, Preliminary Soil Consultation, Proposed Office Buildings, California/Davis Street Property, San Francisco, California, for Cahill Construction Company, plates 2 and 3.

IV. ENVIRONMENTAL IMPACT

A. LAND USE AND ZONING

The proposed use of the project site for an office structure would comply with the general objectives of the San Francisco Comprehensive Plan, and with the specific statement in Section 210.3 of the City Planning Code that the C-3-O, Downtown Office District, is "playing a leading national role in finance, corporate headquarters and service industries, and serving as an employment center for the region. . . . Unrelated uses (are) excluded in order to conserve the supply of land in the core and its expansion areas for further development of major office buildings."

The project height would be about 100 ft. lower than the maximum permitted height of 450 ft., the diagonal dimension would be about 35 ft. less than the maximum permitted diagonal dimension of 200 ft. (above a height of 150 ft.) and the length would be about 30 ft. less than the maximum permitted building length of 170 ft.

The Basic Floor Area Ratio (FAR) of 14:1 for the site would allow about 245,000 gross sq. ft. of building area on the site under the C-3-O classification, exclusive of bonuses. The project would include about 289,000 gross sq. ft. The additional area is based on a corner premium as provided in Chapter II, Article 1, Section 102.14 of the San Francisco Planning Code. Under this article, that portion of a lot in a C-3-O district within 125 ft. of a corner is allowed up to a 20% greater floor area ratio, but no such lot can be considered wider or deeper than 125 ft. The project qualifies for a 43,570 sq. ft. bonus under these provisions./1/ This bonus is allowed in lieu of other available bonuses. The total gross floor area of the project is consistent with this allowed bonus.

NOTE - Land Use and Zoning

/1/ Corner bonus calculation is as follows:

125 ft. x 125 ft. x 14 x 20% = 43,750 sq. ft.

Basic FAR:	245,438
Bonus	43,750
Total Permitted Floor Area	289,188 sq. ft.

B. URBAN DESIGN AND VISUAL ASPECTS

ARCHITECTURAL RESOURCES

Construction of the proposed project would require demolition of 3 buildings. Two of these, 280 Battery St. and 353 Sacramento St., are included in the 1976 Architectural Inventory and are rated "B" in the Heritage architectural historical survey (see III.B, p. 23).

RELATIONSHIP OF THE PROJECT TO THE COMPREHENSIVE PLAN

The Urban Design Element of the San Francisco Comprehensive Plan, adopted by Resolution 6745 of the San Francisco City Planning Commission on 26 August 1971, contains principles and policies intended to serve as guidelines for the design and interpretation of structural and environmental development and for the preservation of architecturally or historically significant buildings or places. The relationship between the applicable urban design policies of the Comprehensive Plan and the proposed project is shown in Table 9.

PROJECT VISIBILITY

The main savings office of the San Francisco Federal Savings and Loan Association, located on the northwestern corner of the building, would be visible from street level areas on adjacent blocks on Battery and Sacramento Sts. and from the open, diagonal pedestrian way. The lobby and shop windows of the retail spaces would be visible from the (text continued on p. 54)

TABLE 9: RELATIONSHIP BETWEEN APPLICABLE URBAN DESIGN POLICIES OF THE SAN FRANCISCO COMPREHENSIVE PLAN AND THE PROPOSED PROJECT

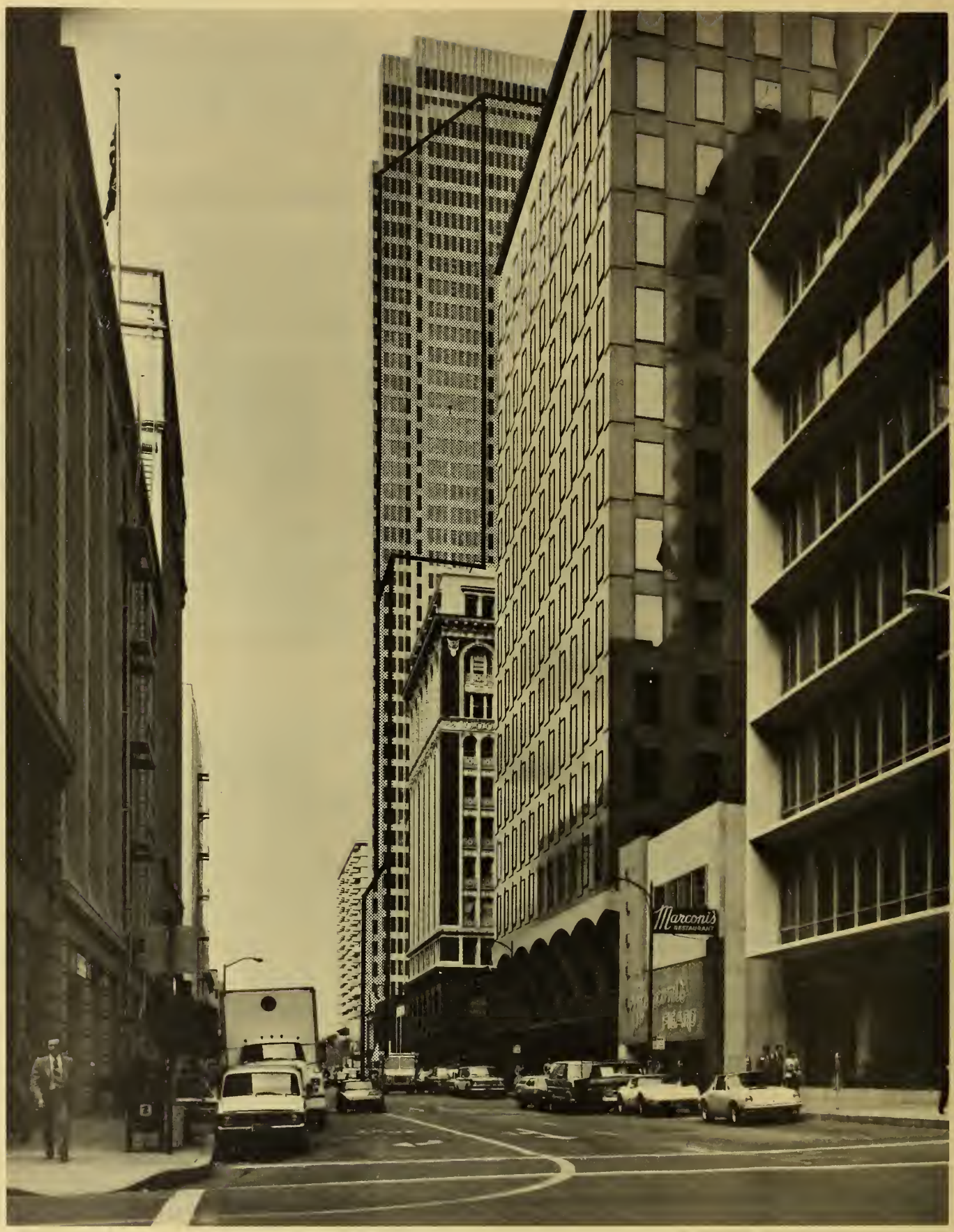
APPLICABLE URBAN DESIGN POLICIES	RELATIONSHIP OF PROJECT TO APPLICABLE POLICIES
A. Policies for City Pattern	
1. Policy 1. Recognize and protect major views in the City, with particular attention to those of open space and water (p. 10).	The project would retain public views down the Sacramento St. corridor to the Bay. It would interrupt some private, upper-story views from Nob Hill across the site to the Bay. Most views across the property are already blocked by the Embarcadero Center to the north and by buildings at 100 California St. and 464 California St.
2. Policy 3. Recognize that buildings, when seen together, produce a total effect that characterizes the City and its districts (p. 10).	The proposed building would be a point tower with a maximum plan dimension of 127 ft. and a maximum height of 351 ft. As such, it would relate to buildings of similar height and bulk at 601 Montgomery, 505 Sansome, 425 California, and 350 California. It would be dominated by the 45-story One Embarcadero Center to the north, and would dominate the 2- and 3-story buildings to the east.
3. Policies for Conservation	
3. Policy 4. Preserve notable landmarks and areas of historic, architectural or aesthetic value, and promote the preservation of other buildings and features that provide continuity with past development (p. 25).	Project implementation would result in the demolition of 2 buildings included in the 1976 Architectural Inventory and rated "B" in the Heritage Survey (see IV.B, p. 51).
. Policy 6. Respect the character of older development nearby in the design of new buildings (p. 25).	In height and design, the building would be compatible with nearby highrise buildings. Because of its height, it would be different in scale and design from nearby post-earthquake, low-rise buildings.
. Policy 7. Recognize and protect outstanding and unique areas that contribute in an extraordinary degree to San Francisco's visual form and character (p. 25).	The project area is part of the Financial District, an area whose visual form is characterized by highrise buildings.

C. Policies for Major New Development	
6. Policy 1. Promote harmony in the visual relationships and transitions between new and older buildings (p. 36).	The polished lightweight material and solar gray glass skin of the building would relate to the glass facade of 425 California St., one block to the south, but is expected to be less reflective. It would be in contrast to the brick of older buildings nearby or the concrete of the adjacent Embaracado Center. The 30-ft. height of the first set back on Sacramento St. would relate to the podium level of One Embarcadero Center.
7. Policy 2. Avoid extreme contrasts in color, shape and other characteristics which will cause new buildings to stand out in excess of their public importance (p. 36).	Although the proposed building would be rectilinear in shape at the base, the upper-level, corner setbacks would result in a distinctive appearance.
8. Policy 5. Relate the height of buildings to important attributes of the city pattern and to the height and character of existing development (p. 36).	See Item 2 above. The building would be more than 200 ft. lower than the adjacent Security Pacific Building at One Embarcadero Center, but would be similar in size and height to other newer buildings in its vicinity.
9. Policy 6. Relate the bulk of buildings to the prevailing scale of development to avoid an overwhelming or dominating appearance in new construction (p. 37).	See Item 2 above. The building would be a point tower with dimensions smaller than the standard 50-vara lot (137.5 ft. x 137.5 ft.) which is prevalent in the area. (The vara is a Spanish unit of measurement. North of Market was laid out in 50-vara lots; South of Market in 100-vara lots.)
D. Policies for Neighborhood Environment	
10. Policy 13. Improve pedestrian areas by providing human scale and interest.	The ground level plan would provide a diagonal pedestrian way and short-cut across the property, with retail uses and display windows opening on either side. Windows near the corner on Battery and Sacramento Sts. would show the interior of the Savings Office, rather than retail displays.

pedestrian way. The proposed truck docks, located on the eastern portion of the site, could be seen from Halleck St. and from the intersection of Battery and Halleck Sts.

The facade of the proposed building would be visible from street level areas on the surrounding blocks on Battery and Sacramento Sts. Views would include all or portions of the building. Views from the intersection of Battery and Pine Sts. south of the project would include the west face of the building and the upper floors of the south side of the building, starting from below the Halleck St. setback at the 14th floor. The upper floors of One Embarcadero Center would be visible as a backdrop (see Figure 22). Views from the intersection of Sacramento and Front Sts. east of the project would include all of the north side of the building including both setbacks on Sacramento St. The tower would replace existing foreground views of older, low-rise buildings and more distant views of high-rise development from portions of the podium level of Two Embarcadero Center. The upper floors of the project would be visible from the east above the existing low- to medium-rise structures fronting on California and Front Sts. The setbacks, landscaped with vines in planters, would provide visual relief.

From mid-range locations, views of the project would tend to blend with the existing or proposed structures. Seen from Telegraph Hill to the north, a portion of the west side of the building would partially fill the existing space between One Embarcadero Center and 100 Pine St. The project would not block any view of the Bay from Telegraph Hill. The project would not be generally visible from street level on Nob Hill to the west because of the intervening Wells Fargo Bank Building at 464 California St. The project could block some views of the Bay from the upper floors of apartments on Nob Hill; but most of the views have already been blocked by existing buildings, such as the Union Bank Building. Views of the project from the Fairmont Hotel, southwest of the site, would be obstructed by the Hartford Building at 650 California St. Existing or proposed structures would block most long-range views of the proposed project. The Embarcadero Center buildings would obscure it from Yerba Buena Island and the Marin Vista Point at the north end of the Golden Gate Bridge.



EXISTING

280 BATTERY ST. ▲ ▲ FIDELITY SAVINGS AND LOAN ASSOCIATION

240-248 BATTERY ST. ▲ ▲(ONE EMBARCADERO CENTER IS IN THE BACKGROUND)

PROPOSED

PROJECT ▲

FIGURE 22: VIEW OF PROJECT FROM PINE ST. NORTH ALONG BATTERY ST.

LIGHT AND SHADOW EFFECTS

The City's Urban Design Policy for Major New Development (San Francisco Comprehensive Plan, Urban Design Element, p. 36) states that "buildings to the south, east and west of parks and plazas should be limited in height or effectively oriented so as not to prevent penetration of sunlight to such parks and plazas." The proposed project would be located south of the podium level of One Embarcadero Center and 1 block to the southwest of the podium level of Two Embarcadero Center.

During early mornings in the fall, winter and spring months (see Figure 23), shadows on the Battery and Sacramento St. sidewalks to the west and north of the site would be unchanged. On summer mornings, Sacramento St. would remain in sunlight and shadows would be cast on the Battery St. sidewalks. New shadows would be thrown on the existing structures to the west of the site.

From mid-morning to mid-afternoon during the spring and fall months (see Figure 24, p. 58), lengthened shadows would be cast on Sacramento St. sidewalks; currently, only part of Sacramento St. is shaded. During the winter, midday shadows would affect the lower and middle floors of One Embarcadero Center. During the summer months at mid-day hours, the project tower would shade the Sacramento St. northern sidewalk.

The project tower would cast early-afternoon shadows on the podium level of Two Embarcadero Center in the spring and fall, and would add to shadowing of the podium level during early afternoons in the winter. There would be no change in existing shadow patterns in the late afternoon and early evening hours throughout most of the year (see Figure 25, p. 59). In the summer, low-rise buildings on the west side of Front St. between Sacramento and California Sts. currently receive sunlight; the project would cast afternoon shadows on these structures.

WIND EFFECTS

The changes the proposed building would make in wind directions and velocities at pedestrian level have been studied by the use of models in a wind tunnel to

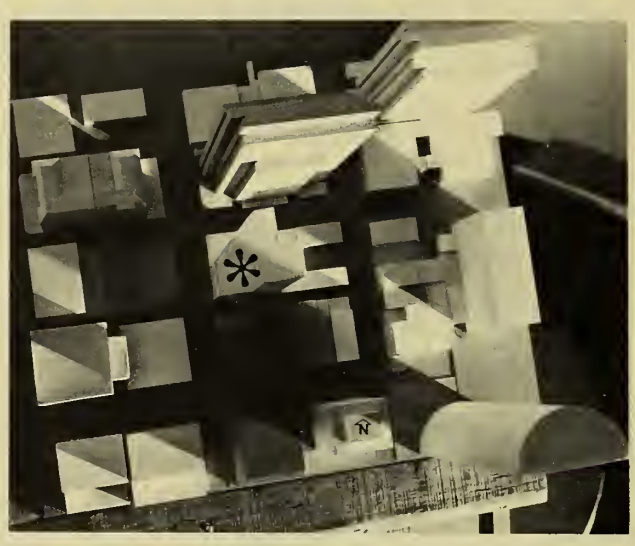
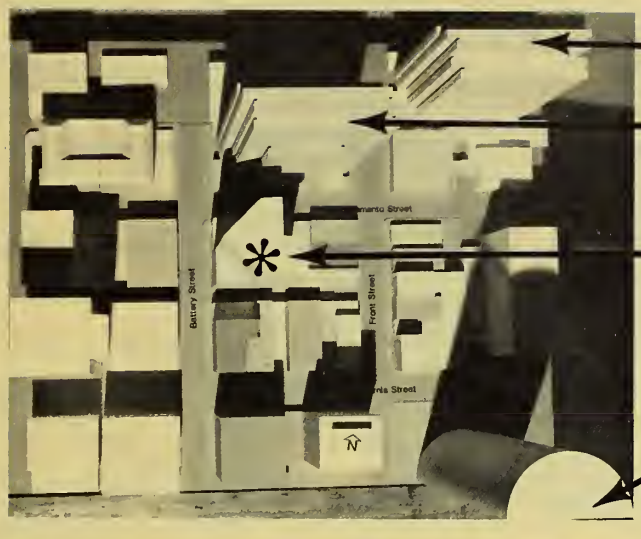
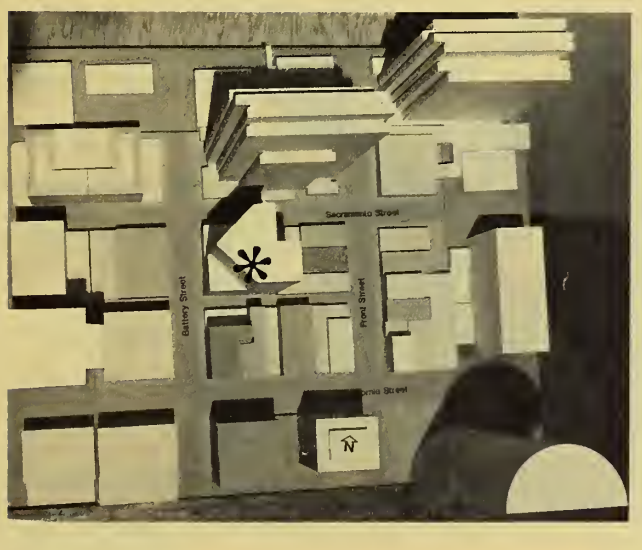


FIGURE 23: PROJECTED SHADOW PATTERNS AT 8 A.M. (STANDARD TIME)



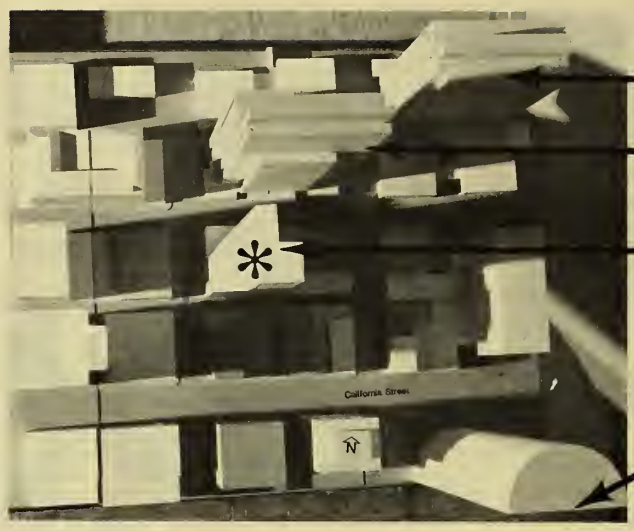
MID-MARCH &
MID-SEPTEMBER

MID-DECEMBER



MID-JUNE

FIGURE 24: PROJECTED SHADOW PATTERNS
AT 12:00 NOON (STANDARD TIME)



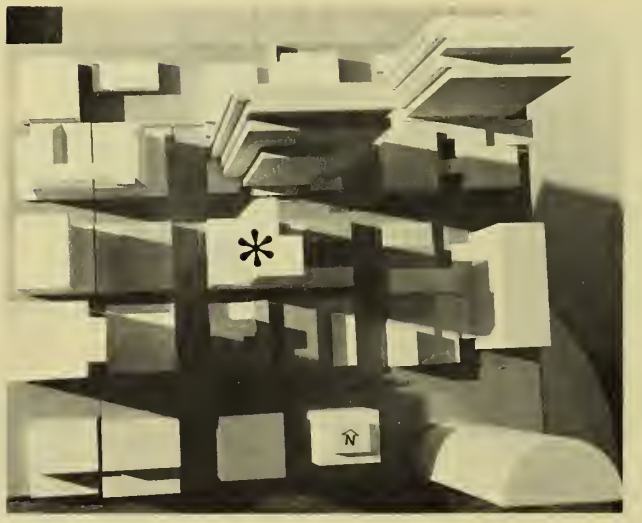


FIGURE 25: PROJECTED SHADOW PATTERNS AT 4 P.M. (STANDARD TIME)

simulate natural winds near the ground (see Appendix C, p. 139 for the text of the study). Tests were conducted for northwest and west winds, the most common wind conditions in San Francisco. Wind speeds at pedestrian levels were evaluated as a percentage of the wind speed measured by the U.S. Weather Service at the top of the Federal Building at 50 United Nations Plaza which is the wind reference point nearest the site. This percentage is the ratio of the wind speed at pedestrian level to the wind speed measured at the top of the Federal Building. The resulting percentage, or wind speed ratio, would remain relatively constant for calm or windy conditions.

Generally, moderately high to high northwesterly wind speed ratios now occur in the area, particularly at the intersections of Battery and Sacramento Sts. and Front and Sacramento Sts. Windflows occur along the north-south streets, diminishing in speed towards the south. Along east-west streets, northwesterly winds are generally turbulent, with wind speed ratios varying from moderate to moderately high. The pedestrian podium levels at One and Two Embarcadero Center have high to very high wind speed ratios. During westerly winds, the site is sheltered by upwind buildings so that the wind speed ratios are light, ranging from low to moderately low.

The project would not affect basic northwesterly air flow paterns, except along Sacramento St. Wind speed ratios along Sacramento St. near the site would decrease by about 10%, while wind speed ratios on Halleck St. would decrease by about 21%. The greatest impact under northwesterly wind conditions would occur at the northeast corner of Halleck and Battery Sts. where wind speed ratios would increase by approximately 40% from moderate to moderately high. Wind speed ratios would also increase near the intersection of California and Battery Sts. Wind speed ratios at the podium level of the Embarcadero Center would be unchanged. Wind speed ratios on the roofs of the setbacks at Halleck St. and between the entranceways would be high, particularly on the Halleck St. setback. The Sacramento St. setback would be sheltered from the wind.

The project would cause changes in the air flow patterns of westerly winds near the site. The northerly flow of these winds along Battery St. would be reversed south of the site, and enhanced north of the site by the wind

intercepted by the project. Wind speed ratios at the intersection of Battery and Sacramento Sts. would increase from moderately low to moderate, as would wind speed ratios on the west side of the intersection of Battery and Halleck Sts. Wind speed ratios would increase along Halleck and Sacramento Sts. from low and moderate (see Appendix C, p. 139).

C. CULTURAL AND HISTORIC ASPECTS

The building excavation would extend to a depth of 15 ft. below the existing surface, or 5 ft. below the existing basement level. There is no recorded citation of any sunken ships on the site. However, there is a possibility of finding fragments from unrecorded sunken ships and gold rush era artifacts which were deposited in the fill material. Recorded data on ship locations is derived from a number of sources and may not be completely accurate (H. Soeten, Curator of the Maritime Museum of San Francisco, personal communication, 27 February 1979).

D. COMMUNITY SERVICES AND UTILITIES

(See the end of this section for a list of persons consulted in its preparation.)

Police. As more people would be employed on the site, the project would result in an increase in the number of calls for police assistance. Petty thefts could increase. Captain D'Arcy, Commanding Officer of the Central District Station, does not anticipate that additional police officers would be required./1/

Internal security would be provided to the Daon Building by a 24-hour security guard service in the lobby, with an additional guard at night. Closed-circuit television would be used to survey the loading docks. San Francisco Federal Savings and Loan Association would also provide its own security system for banking operations on the ground floor.

Fire. The project would incorporate the fire protection measures required by the San Francisco Building Code. There would be no need for additional fire-fighting staff or equipment, according to City Fire Marshal W. Graham. The existing water supply would be adequate to meet the needs of the proposed project for fire-fighting services./2/

Water. Domestic water would be provided from the Water Department's existing mains under Battery or Sacramento Sts. No capital improvements to the water distribution system are anticipated. Either Battery or Sacramento Sts. would have to be disrupted from the curb to the mains for approximately 3 working days to excavate and install water service. Vehicle and pedestrian traffic would not be interrupted; 1 parking lane would be eliminated during construction.

At full project occupancy, estimated daily water demand would be 31,000 gallons, approximately 15 times the current daily use at the site of 2,000 gallons./4/ This would be about 0.04% of the average daily San Francisco water use of 79.1 million gallons in 1978. Cumulative Downtown development (see Appendix H, p. 167, for a list of buildings considered), including the proposed project, would use an estimated 2,790,000 gallons per day, 3.5% of the average daily San Francisco water use. An estimated 75,000 gallons of water would be used during the 19 months of construction.

Sewer. Projected wastewater flows generated by the project at full occupancy would be approximately 31,000 gallons per day. There is sufficient sewer capacity to accommodate projected flows and no mains would have to be removed or enlarged. The North Point Water Pollution Control Plant would be able to provide treatment for the dry-weather flows./5/ Wastewater flows from the project would constitute about 0.06% of the average daily dry-weather flow of 52 million gallons to the North Point Water Pollution Control Plant. The increased flows generated by the project would contribute to existing storm overflows of sewage into the Bay during wet weather until projects now under design to reduce these flows are completed.

Cumulative Downtown development (see Appendix H, p. 167, for a list of buildings considered), including the proposed project, would generate

approximately 1,421,000 gallons of wastewater per day, 2.7% of the average daily wastewater flows to the North Point Plant.

Dewatering of the construction site would generally occur only during rainstorms and would be required intermittently for about 26 weeks. Periodic discharge into the sewers would occur during this period.

Solid Waste. The proposed project would generate approximately 1.5 tons per day of solid waste./6/ This is about 5 times the current amount of 600 lbs. generated on the site and would represent less than 1% of the Golden Gate Disposal Company's current daily volume of 1,500 tons. Golden Gate Disposal Company would have no difficulty in accommodating the demand./7/ Cumulative Downtown development (see Appendix H, p. 167), including the proposed project, would generate an estimated 73 tons of solid waste per day, about 4.8% of the current daily volume collected by Golden Gate Disposal Company.

Approximately 6,800 cu. yds. of material would be removed from the site during construction to an undetermined private landfill site on the Peninsula.

Telephone. To provide telephone service to the project, Pacific Telephone & Telegraph Company would install a new conduit to reinforce the existing system. One of the 2 lanes of traffic on Sacramento St. would be blocked for up to 2 weeks during installation of the conduit. Pacific Telephone and Telegraph indicates that its system would be able to handle the additional circuit load from the project./8/

NOTES - Community Services and Utilities

/1/ Capt. G. D'Arcy, Commanding Officer, Central District Station, Police Department, letter communication, 16 February 1979 and telephone communication, 14 March 1979.

/2/ Chief W. Graham, Fire Marshal, Fire Department, letter communication, 12 February 1979.

/3/ J. Kenck, Manager, City Distribution Division, Water Department, letter communication, 26 February 1979.

/4/ The water demand estimate assumes retail use of 200 gallons per day and office use of 125 gallons per day per 1,000 sq. ft. of usable floor space;

Brown and Caldwell Consulting Engineers, 1972, Report on Wastewater Loading from Selected Development Areas, as cited in San Francisco City Planning Commission and San Francisco Redevelopment Agency, 1978, Final Environmental Impact Report/Yerba Buena Center, EE.77.220.

/5/ M. Francies, Investigation Section, Bureau of Sanitary Engineering, letter communication, 20 February 1979.

/6/ California Solid Waste Management Board guidelines developed in 1974, "Solid Waste Generation Factors in California" (308,000 gross sq. ft. x 1 lb. per 100 gross sq. ft. per day = 3,000 lbs. or 1.5 tons per day).

/7/ F. Garbarino, Office Manager, Golden Gate Disposal Company, telephone communications, 20 March 1979 and 1 June 1979.

/8/ W. Ottens, Engineer, Pacific Telephone and Telegraph Company, telephone communication, 8 March 1979.

E. ECONOMIC ASPECTS AND RELOCATION

SITE-RELATED DIRECT IMPACTS

Office and Retail Space. The project would continue the trend toward higher rents and more intensive use of land in the Downtown business district. Construction of the Daon Building would cause the removal of about 26,000 gross sq. ft. of office space, and add about 275,100 gross sq. ft. to the existing 56 million sq. ft. of office space in Downtown San Francisco. This would be about a 0.5% increase over existing total Downtown office space and a 1% increase over Downtown space in high-rise structures. The net increase in leasable office space would be about 212,000 net sq. ft. The project would cause the removal of about 10,300 net sq. ft. of leasable ground-level retail and restaurant space and would replace it with about 8,300 net sq. ft. of retail space (3,800 sq. ft.) and commercial banking space (4,500 sq. ft.) on the ground floor.

Annual rents at the Daon Building would range from about $25 per sq. ft. for retail space and $15 to $19 per sq. ft. for office space./1/ These rents would be about 1-1/2 to 2 times higher than existing rents on the site.

Permanent Employment. Total permanent employment at the project site would be about 1,200 persons as compared to current employment of about 250 persons./2/ About 98% of the workers would hold office jobs. Table 10 shows a breakdown of employment by type.

TABLE 10: ESTIMATED GROSS PERMANENT OFFICE COMMERCIAL AND MAINTENANCE EMPLOYMENT*

Retail	6
Savings Office	10
Office	1,190
Maintenance & Security	14
TOTAL	1,220

*The table assumes 600 net sq. ft. per retail employee, 200 net sq. ft. per office employee (based on anticipated employee density of San Francisco Federal Savings and Loan Association), and zero vacancy, and represents a probable daytime population of 1,220.

San Francisco Federal Savings and Loan Association would lease about 1/5 of the total project net leasable office space, vacating space it currently occupies at 79 and 85 Post St. and 46 and 52 Kearny St. San Francisco Federal currently employs about 170 persons (of whom about 67% are San Francisco residents) and expects to employ about 215 persons in 1983, increasing to about 240 persons in 1985. No other tenants are committed at this time.

Secondary Income Effects. Secondary employment and income effects would result from permanent project employment because each employed person would generate additional employment opportunities and income by his or her demands for goods and services. Previous studies have indicated that San Francisco resident employees spend 80% of their disposable income in the City,/2/ creating secondary income and employment. Were the percentage of building employees who are San Francisco residents to be similar to that of San Francisco Federal Savings and Loan, an estimated $8.7 million of secondary income would be generated in the City based on San Francisco Federal Savings and Loan employees' average annual disposable income ($14,500 minus 25%

taxable gross income). This does not imply that all of the secondary income generated by building employees would be new to the City, since firms already located in the City would be expected to relocate to the proposed building. The draft Projections 79 prepared by the Association of Bay Area Governments (ABAG) indicates that there will be about 96,000 more jobs in San Francisco in 1985 than there were in 1975 and about 10,000 more employed residents, despite a decrease in total population of about 32,000 persons (see Appendix I, p. 168). If this percentage of approximately 10% is considered as the increase in San Francisco residents permanently employed as a result of the proposed project, then the secondary income generated by the project would be about $1.4 million.

A 1974 survey of Downtown office workers by Keyser Marston Associates, Inc. estimated that taxable annual expenditures for meals, apparel, cosmetics and so forth by workers are about $950 per capita (escalated at 6% annually to 1979 dollars)./3/ Total Downtown expenditures by permanent project employees are estimated at $1.1 million annually.

Short-Term Construction Employment. Based on an annual average wage of $28,000, it is estimated that the project would require about 190 person-years of construction labor with a construction payroll of $5.4 million./4/ This is approximately an average of 120 full-time jobs at any one time during the 1-1/2 year construction period. J. Singer of Swinerton and Walberg Construction Company estimates that about 84 to 90, or 70% to 75%, of those jobs would be expected to be held by San Francisco residents (telephone communication, 2 February 1979). Secondary temporary employment effects would also be created when construction laborers spend their incomes on goods and services. These secondary jobs could be estimated on the basis of a 1 to 1 ratio, or 1 secondary job for every direct construction job./4/. This would be the equivalent of 190 full-time 1-year jobs in the region.

Relocation. Eleven businesses employing about 250 persons would be displaced from the project site. Interviews were conducted with each of the 11 tenant businesses to find out the effects of relocation on these businesses (see also Appendix D, Table D-1, column 6, p. 151). Surveyed businesses indicate that

the effects of relocation would include time spent in searching for a new location, planning renovations and moving, and the costs of renovation and moving. Many businesses anticipate difficulty in finding a comparable new location. Gourmet Plate and Stone Soup restaurants indicate that moving and reinstallation of food preparation equipment would be difficult and costly. A spokesperson for M. Arthur Gensler and Associates, which occupies about 28,000 sq. ft. of space, states that heavy office equipment would have to be moved. Retail tenants such as Vaughn-at-Sather Gate, Inc. and Snappy Foto indicate that they could lose clientele if new locations were in an area with fewer pedestrians. Some businesses expressed an interest in occupying space in the proposed building; this would involve a temporary closure of their business, moving to a temporary location, during construction of the proposed project. Tenants also expressed the concern that rents for comparable space in the proposed building would be too expensive.

The Gourmet Plate and Stone Soup restraurants indicate that demolition of the buildings they occupy would probably result in the closure of their businesses; Healey and Associates, an advertising firm, states that it might move out of San Francisco if displaced from the project site. Should these businesses close or relocate outside of San Francisco, an estimated 30 jobs would be eliminated in San Francisco. No other tenants indicate that they would anticipate closing or relocating outside of San Francisco if displaced from the project site. The retention of small business firms in San Francisco is a goal of the Mayor's Office of Economic Development. This Office, through its Neighborhood Business Revitalization program, provides relocation advice and loan assistance to displaced firms./6/

Assessed Valuation and Property Taxes. The fair market value of the project would be estimated at $27.0 million (in 1979 dollars). A table titled "Estimates of Project Value and Property Tax," containing the calculations on which this estimate is based, is on file at the Department of City Planning, Office of Environmental Review. The property would have an estimated $6.75 million assessed value, and would generate between $270,000 to $337,000 total property tax revenues annually (in 1979 constant dollars). Appreciation of land value and escalation of construction costs is expected before fiscal year

1982-1983; however, estimates are given in constant dollars. Both the low and the high tax estimates assume the existing tax structure, full occupancy, and appraisal of market value based on income potential. The low estimate is based on a tax rate of $4 per $100 assessed value. The high estimate is based on a tax rate of $5 (the $4 maximum composite tax rate allowable under Proposition 13 plus the $1 tax rate for previously approved San Francisco bond debt). The 1979-80 rate is $4.97.

Assuming the City and County were to receive the same proportion of property taxes as this fiscal year, it would receive between $229,500 and $286,500 (85% of the total $270,000 to $337,000 composite property tax revenues). Subtracting the assessed value of the existing land and improvements on the block which total $385,600 million, the net addition to San Francisco's property tax base would be $6.4 million. The net increase over existing composite property tax revenues to the City and County of $16,300 (see Appendix E, Table E-1, p. 156) would be between $229,500 and $270,200.

Assuming average gross receipts of $150 per net sq. ft. for similar new retail space,/7/ the 3,800 net sq. ft. of retail use at the Daon Building would generate an estimated $37,000 in sales tax revenues. The City and County would receive about $5,600 in sales tax revenues and BART would receive about $2,900. Based on an estimated $1.1 million of taxable purchases by the Daon Building employees, the site would generate an estimated $11,000 in indirect sales tax to the City and County and $6,000 to BART. The estimated payroll expense tax generated from the project site would be about $97,000, depending on the earnings of the estimated 980 non-Savings and Loan employees. (A table showing assumptions and calculations of the payroll expense tax is available for public review at the Department of City Planning, Office of Environmental Review.) In the short run, this tax revenue would not be net revenue, because first occupancy would be by San Francisco Federal Savings and Loan Association which would relocate from other San Francisco locations. Only as space at the Daon Building and vacated space elsewhere in the City is taken by employees entering the labor market in San Francisco would the availability of new office space at the Daon Building be said to generate incremental (net) new business tax revenues (see the Cumulative section below).

Costs and Net Revenues. Water and sewer operating cost increases would be covered by user charges. Office development in downtown San Francisco does not increase the capital costs required for an upgraded sewer system designed to meet federal legal requirements, because the existing sewer mains that would serve the site and the capacity of the planned sewage treatment facilities are sized for wet-weather flows which are in excess of the City's average daily dry-weather flows. Public safety costs would not increase in proportion to increases in Downtown daytime population or increases in property value of the block (see IV.D, p. 61). Some increases in general government administrative costs could be expected with the increased intensity of uses on the block. Street-related costs, such as maintenance, storm drainage, lighting, and cleaning, would not be measurably affected.

City and County costs attributable to the site can be viewed as the site's proportion of increased costs attributable to Downtown cumulative commercial growth. Increased City and County property taxes ($229,500 to 270,200) and payroll/business taxes ($74,400), plus user charges, and continuing sales taxes from the project site would offset incremental (marginal) costs to the City and County of public services for the project site.

According to the San Francisco Unified School District (L. Eickert, Business Manager, telephone communication, 27 November 1978), Downtown office development would have no direct net effect on school expenditures, but would increase the proportion of total school expenditures financed by the property tax.

Cost increases would be expected for several agencies which provide public transit, such as the Muni and BART. According to estimates of project-generated Muni ridership (see IV.F, p. 80), Muni lines serving the site in 1981 would be operating at 64% of total seated and standing capacity (averaged over the 1-hour peak). Muni would not be expected to have to add buses or increase capital outlay costs, beyond planned increases in service and capital costs, to provide peak-hour service to riders from the project. Muni estimates an average operating cost per trip of $0.74 and an average paid fare per passenger of $0.20, resulting in a per paid passenger fare deficit of

$0.54 (Barbara Brown, Planner and Larry Elliot, Cost Accountant, San Francisco Municipal Railway, telephone communications, 8 January 1980). The $0.54 fare deficit is made up by City ad valorem taxes and State and Federal subventions. Under worst-case Muni ridership conditions, the Daon project would generate an estimated 1600 Muni trips per day, resulting in a total annual Muni operating deficit of $225,000 attributable to the Daon project. Muni does not anticipate a decrease in this deficit in the near future, because planned improvements such as the Muni Metro system will increase future costs in proportion to increased passenger ridership. Muni does expect, however, that the portion of the fare deficit covered by State and Federal subvention will increase, thereby decreasing the portion of the deficit borne by San Francisco taxpayers (Larry Elliot, Cost Accountant, San Francisco Muinicipal Railway, telephone communication, 8 January 1980).

About 280 trips on BART would be generated each week-day by the proposed project. At the existing average deficit per trip of $1.25,/8/ this would result in an annual deficit of about $89,000. The direct sales tax revenues from retail sales at the site and indirect sales tax revenues from purchases in San Francisco by workers at the Daon Building would partially cover this annual deficit. Eventually, BART plans to increase capacity by extending the lengths of trains or by running more trains (reduced headway time), which would also increase ridership. Under these conditions, the average deficit per commuter would decrease and added costs would be negligible in relation to increased fare revenue. With respect to capital costs, the increased tax base attributable to the project, on which fixed cost BART bond taxes are levied, would enable future bond taxes on existing property elsewhere in San Francisco to be reduced (W. Belding, Senior Economist, BART, telephone communications, 9 September 1978 and 4 May 1979).

CUMULATIVE AND INDIRECT ECONOMIC AND FISCAL IMPACTS

Downtown Office Space. Past trends indicate that new Downtown office space is likely to be built and absorbed at a much higher rate than citywide office employment growth. This is due to increased space per employee and

relocations to Downtown from elsewhere in San Francisco./9/ This project plus the 8 high-rises which are under construction, and the other 3 which have been applied for or are in design, totaling 7.6 million sq. ft.(see Appendix E, Table E-2, p 157), would represent an estimated 5-year supply of office space, assuming absorption at the historic 1970-79 construction rate of 1.52 million gross sq. ft. per year, or an 7-year supply if the absorption rate should decline to the 1960-69 rate of 1.03 million gross sq. ft. per year. Due to existing demand caused by the current shortage of office space, it is possible that the absorption rate would be higher than either historic rate. If all these buildings were to be completed in the early 1980's, there could be a short-term cumulative impact of oversupply. The oversupply, if it should occur, could have the additional effect of preempting or slowing office development elsewhere in the City, such as the northern Waterfront or South of Market St. areas. The following is quoted from the 1977 Yerba Buena EIR, Appendix D, p. 34-5. (The words underlined are revised in line with more recent data.

> "According to estimates by the Department of City Planning the financial and administrative district (C-3-O zoning district), which allows the highest floor area ratios in the City, has a theoretical capacity to accommodate 30+ million sq. ft. of new office space, in addition to the 6+ million sq. ft. available in Yerba Buena Center. Even if site clearance or parking requirements reduce this theoretical capacity in half--to 15 million sq. ft.--the 6+ million sq. ft. in YBC, and this 15 million sq. ft. in other parts of San Francisco represent a 14-21 year supply of available high-density office space within the downtown district and YBC at recent absorption rates (1.0 to 1.5 million per year). As pointed out in the Arthur D. Little report to the San Francisco Department of City Planning in 1975, 'These facts suggest the possible desirability of restraining growth north of Market St. in order to accommodate new growth on land already prepared for development in the YBC project area. This strategy would reduce the necessity for demolition and reconstruction in the downtown, and maximize the fiscal benefits derived from construction of new buildings on vacant land'."

Displacement of small service-oriented firms in the Downtown could also encourage conversion and rehabilitation of vacated older warehouse and light industrial space in San Francisco and vacated older office space outside of the Downtown (W. Evers, Mayor's Office of Economic Development, telephone communication, 8 November 1978). Secondary dislocation effects on older downtown offices could also occur. As various firms upgrade to relatively

hign-rent spaces vacated in high-rises built in the 1960's and early 1970's (such as firms relocating to space which San Francisco Federal Savings and Loan Association would vacate), secondary vacancies could occur in older, pre-war buildings. Reduced rents and/or higher vacancy rates in these older buildings could lead to deferred maintenance.

Fiscal. Up until the passage of Proposition 13, revenues generated to the City and County from Downtown commercial development could be expected to cover incremental City and County costs to provide services . Proposition 13 decreases property tax revenues by limiting property taxes to 1% of market value and by limiting the annual increase in property taxes to 2%, unless property is sold and reappraised.

Based on the SPUR study, the Downtown San Francisco Conservation and Development study states that, in the short run, initial revenues from new Downtown construction would be expected to exceed public costs to serve these projects. However, in the long run, as municipal costs continue to rise and property taxes are limited to a 2% per year increase, the initial net surplus would eventually not be able to cover costs, resulting in a net deficit./10/

The single most important cost consideration for new Downtown development is funding for public transit. Cumulative office development could cause increased capital costs for transportation facilities, both public and private. Transit systems are supported by fares and state and federal subventions derived primarily from state and federal gas taxes. The remaining costs are financed locally by sales taxes which (with fares) are the primary support for BART operating costs, and by property taxes which are the primary support for Muni and the source of funding for debt service on BART capital costs. It has been suggested that "vehicle congestion is a threshold factor . . should the 1990 maximum growth level become a reality"./11/ This "threshold factor" would determine the requirement for new capital improvements to transportation systems - such as extension of BART to the Peninsula or a second deck on the Golden Gate Bridge. Until a public determination that this "threshold" has been reached, the "costs" of congestion due to private vehicles would be borne privately in the form of delays, and vehicle-related costs, including air pollution./12/

NOTES - Economic Aspects

/1/ K. Usher, Senior Vice President, Cushman and Wakefield, telephone communication, 1 March 1979.

/2/ San Francisco Department of City Planning, Final Environmental Impact Report, 180 Montgomery Street Building, EE 76.162, July 1977.

/3/ A summary of the survey findings are presented in San Francisco Planning and Urban Renewal Association, June 1975, Detailed Finding: Impact of Intensive High Rise Development in San Francisco, Final Report, pp. 262-263, Table 68. Hereinafter referred to as SPUR.

/4/ J. Singer, Project Manager, Swinerton and Walberg Construction Company, telephone communication, 2 February 1979.

/5/ Two construction employment multipliers, 2.0 and 1.9, have been used for downtown commerical office projects in San Francisco. These multipliers have been derived independently by 2 San Francisco-based economic consulting firms. The 2.0 construction employment multiplier was derived by Lord and LeBlanc and is contained in:

- City and County of San Francisco, Department of City Planning, Final Environmental Impact Report: Yerba Buena Center, EE 77.220, 6 January 1978, Appendix D., Economics, p. 40cc, and;

the 1.9 construction employment multiplier was derived by Gruen, Gruen and Associates and is contained in:

City and County of San Francisco, Department of City Planning, Draft Environmental Impact Report: Bank of Tokyo of California Building, EE 74.170, 24 January 1975, p. 41.

These multipliers should be considered as rough indicators of the number of secondary jobs that could result from project construction employment.

An employment multiplier is a quantitative expression of the extent to which a change in local production induces an overall change in employment. The construction multiplier as stated in this report means that, for each person employed as a result of a project, additional regional employment opportunities would be generated by his or her demand for goods and services.

/6/ G. Oliver, Project Manager, Mayor's Office of Economic Development, telephone conversation, 27 October 1978.

/7/ C. Nicholas, Former Director of Retail Leasing, Cushman and Wakefield, telephone communication, 19 April 1979.

/8/ Muni and BART average deficits per trip should not be cross-compared because each agency has its own cost-accounting methodology and considerations. Each deficit figure has been independently derived by the agency using cost and revenue assumptions unique to each system.

/9/ Based on past trends, SPUR projections from 1974 to 1990 varied by a factor of 3 for new office space (from 10 to 30 million sq. ft. absorption), but by a factor of only 2 (from 49,000 to 87,000 more office workers) for increased employment.

/10/ Sedway/Cooke, October 1979, Downtown San Francisco Conservation and Development Planning Program, Phase 1 Study, pp. 56-58.

/11/ SPUR, op. cit., p. 8.

/12/ SPUR, op. cit., pp. 277-316.

F. TRANSPORTATION AND PARKING

DEMOLITION, EXCAVATION, AND CONSTRUCTION

During the estimated 19-month construction period, transportation impacts would result from trucking movements to and from the site during demolition, excavation, and construction. Demolition activity would generate an average of 36 truck movements per day in and out of the project site over an 8-week period./1/ Excavation would generate an average of 14 truck movements per day over a 10-week period. Construction activity would require an average of 20 truck movements per day over a 65-week period to deliver glass, stone, concrete and steel. Trucks would enter the site from Halleck St. and would exit via Battery St. The demolition and excavation trucks would haul materials to an undetermined disposal site on the Peninsula and would most likely use the freeway ramps at Main and Beale Sts. The truck traffic could also use the freeway ramps at Washintgon and Clay Sts; traffic congestion on Front St. between Sacramento St. and Clay St. may preclude use of Clay St. by the truck traffic.

The trucks would increase traffic congestion on the access streets and haul routes. Truck traffic from 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. would conflict with peak-hour traffic. During demolition and excavation, street traffic on Battery St. would be interrupted when trucks leave the site, particularly during the morning peak hour. Increased traffic congestion caused by trucks operating on transit preferential streets would impact

transit schedules by causing delays to transit vehicles. Trucks would also impede morning traffic eastbound on the James Lick Freeway when moving into the left lane to enter the Embarcadero Freeway. Evening peak-hour traffic would be slowed by trucks moving up the Beale St. on-ramp to the James Lick Freeway or Bay Bridge. No disruption of street traffic would result from on-site, construction-related activities.

Construction traffic from other buildings under construction in the project vicinity during the same period as the project would compound the effects of the construction traffic from the proposed project.Due to changes in construction schedule of proposed buildings, it is not possible to determine which of the other buildings now proposed would be under construction at the same time as the proposed project.

PROJECT TRAVEL DEMAND

An estimate of the amount of travel associated with the 3 categories of leasable building space was computed using the following trip generation factors: 3.5 person trip ends per office employee; 30 person trip ends per 1,000 ft. of retail space; and 75 person trip ends per 1,000 sq. ft. of financial institution space./2/ A trip end is a 1-way trip from an origin (home, for example) to the proposed project, or a 1-way trip in the reverse direction. A total of 4,570 person trip ends per work day is anticipated.

The travel demand was assigned to modes on the basis of work and non-work trips. As a result of the mix of uses in the building, all of the office use trips were considered as work trips, although the generation rates include non-work trips as well. The retail and bank use trips were considered entirely as non-work travel, although the generation rates include work travel for the bank and retail uses. The assumption was made that this method of assigning the travel would be self-compensating in that the work trips by retail and bank employees would be grouped with the office generation and the non-work trips from the office uses would be grouped with the retail generation. This analysis was assumed to be conservative, as all of the trips were considered to be primary trips (from outside of the project to the project and the reverse) when, actually, secondary trips would occur (i.e., trips wholly internal to the project./3/

Service-vehicle trips have been assumed to occur at the rate of 0.23 service-vehicle trips per 1,000 sq. ft. of gross floor area./4/ At this rate the project would generate 65 service-vehicle trips per weekday. Averaged over an 8-hour working day, the project would generate an average of 8 service-vehicle trips per hour. Service-vehicle trips are included in total trips given in Table 11.

Of the total 4,570 person trip ends generated, it is estimated that about 2,340 would be by transit, 2,150 by automobile and 80 by walking as a primary mode of transportation (see Table 11). The walk column in Table 11 shows both secondary and primary walk trips. As no parking would be provided, all persons would be required to walk onto the site./5/

TABLE 11: ESTIMATED 24-HOUR WEEKDAY TRAVEL DEMAND GENERATED BY THE DAON BUILDING*

Area of Residence	%	Total	Auto	Transit	Walk**
North Bay	6	280	180	100	280
Peninsula	17	790	600	190	790
East Bay	13	610	290	320	610
San Francisco	64	2,890	1,080	1,730	2,890**
TOTAL	100	4,570	2,150	2,340	4,570

*Retail, office and savings office person-trip-ends.
**About 80 person-trip-ends would result from persons walking to and from the site who would not use any other form of transportation.

SOURCE: TJKM, Traffic Engineers, see note #5, p. 88.

The 24-hour automobile travel generated by the expected project tenants was analyzed (see Appendix I, p. 168, for discussion of applicability of ABAG draft Projections 79 data to the proposed project). For each of the 7 geographic areas considered (North Bay, East Bay, Peninsula and San Francisco divided into 4 sections), an average trip length was estimated and the vehicle-miles travelled were calculated. The total vehicle-miles of travel generated by the project are estimated to be 16,100 vehicle-miles per day with an average trip length of 10.5 miles 1-way.

TRAFFIC IMPACTS

In assessing the new traffic which would be generated by the project in relation to other traffic expected to be on the streets in 1981, the expected year of completion, an expansion factor of 1.8% per year was used to increase the known 1978 traffic volumes to expected 1981 base levels. This annual expansion rate is used by the City and County of San Francisco for planning purposes. It was developed by the San Francisco Department of Public Works in its Downtown Parking and Traffic Survey (DPATS) in 1970. Since growth factors are based on historical trends, traffic projections using growth factors are contingent upon the availability of sufficient future street capacity. Thus, when peak-hour traffic volumes grow to equal the capacity of a street, further growth in vehicular flow would not be possible. Consequently, either the peak hour would expand to include other hours, some of the traffic would switch to nearby streets, or there would be a shift to modes of travel other than the automobile.

Table 12 shows the 1981 projected base volumes on streets near the proposed project, the increases in traffic volumes estimated to be caused by the proposed project, and the percent of the peak-hour increase over the 1978 base level which would be caused by the project. Project-induced increases on the surrounding streets would range from about 2% on Battery St. to about 7% on Beale St.

The effect of the project on the capacity of nearby intersections during the peak-hour in terms of volume-to-capacity ratios is shown in Table 13. The Mission St. intersections with Beale St. and Main St., the intersection of Battery and Washington Sts., and the intersection of Clay St. and Front St. would operate at Level of Service C or above for the 1981 Base condition. The project would increase the volume-to-capacity ratios slightly at each of the intersections, but would not cause a change in Level of Service; it should be noted that calculations are accurate only to within 10%. Vehicle speeds in the project vicinity would decrease as the additional project-generated traffic is added to the street system, but would not decrease below an average 15 miles per hour.

TABLE 12: PROJECTED 1981 VEHICLE VOLUMES ON STREETS NEAR PROJECT

Street*	EXISTING (vehicles) 24 Hour	Peak Hour**	Peak 8 Hour	1981 BASE (vehicles) 24 Hour	Peak Hour**	Peak 8 Hour	1981 BASE + PROJECT (veh.) 24 Hour	Peak Hour**	Peak 8 Hour	% of Increase Per Peak Hour Due to Project***
Beale	8,000	980	4,800	8,400	1,030	5,000	8,800	1,100	5,220	6.8
Main	13,400	1,520	7,980	14,100	1,600	8,400	14,500	1,670	8,620	4.4
Clay	29,200	2,290	16,370	30,800	2,410	17,300	31,200	2,450	17,520	2.9
Washington	15,600	1,970	9,380	16,400	2,080	9,800	16,800	2,150	10,020	3.4
Battery	14,700	1,420	8,510	15,500	1,500	9,000	15,700	1,540	9,220	2.3

*The section of each street is shown in Table 4, p. 35.
**The single peak hour during the peak period between 4:00 and 6:00 p.m., except for Washington and Main Sts. where the peak period is between 7:00 and 9:00 a.m.
***Percent increase over the 1981 base traffic volume.

SOURCE: See Appendix F, p. 158.

TABLE 13: PROJECTED 1981 PEAK-HOUR INTERSECTION VOLUME-TO-CAPACITY RATIOS*

Intersection	Existing	Critical Approach (Direction)	1981 Base	Critical Approach (Direction)	1981 Base + Project	Critical Approach (Direction)
Clay and Front	0.57	Eastbound	0.59	Eastbound	0.61	Eastbound
Battery and Washington	0.72	Westbound	0.76	Westbound	0.76	Westbound
Mission and Beale	0.69	Eastbound	0.72	Eastbound	0.74	Eastbound
Mission and Main	0.71	Northbound	0.75	Northbound	0.77	Northbound

*Service-volume capacities for these intersections are shown in Table 5, p. 36.

SOURCE: See Appendix F, p. 158.

PARKING IMPACTS

The daily parking demand which would be generated by the project is estimated to be 630 parking spaces. The parking demand has been calculated based on the number of auto driver work and non-work trips projected./6/ The average percentage of non-work trips for multi-tenanted buildings is estimated to be 22% (this corresponds closely to the non-work percentage assumed in the travel demand analysis)./4/ The average length of stay for non-work trips is estimated to be 1.4 hours./4/ To estimate the work parking demand, all of the auto driver work trips were assumed to generate demand for 1 parking space per trip or 600 spaces. The non-work parking demand was calculated by dividing the non-work auto driver trips by a turnover factor based upon the averge length of stay. The turnover factor was calculated by dividing an 8-hour working day by the average length of stay of 1.4 hours to give a factor of 5.7. Thus the non-work parking demand was calculated to be 30 spaces and the total demand is estimated to be 630 spaces. The project would not provide any offstreet parking, leaving a deficit of 630 project-related spaces. Parkers would be expected to use other facilities outside of the study area, particularly south of Market St.

Objective 1, Policy 7 of the Plan for Transportation (for full text of objectives and policies discussed, refer to the Revisions to the Transportation Element of the Master Plan Regarding Parking, City Planning Commission Resolution 7647, 20 January 1977) encourages such devices as staggered work hours to reduce "peaking of travel during (peak) hours". San Francisco Federal Savings and Loan Association would establish such a system of staggered working hours for its employees. Objective 1, Policy 10 of the revised Downtown Transportation Plan states "Develop the Downtown Core as an automobile control area". Objective 1, Policy 4 states "Discourage the addition of new long-term parking spaces in and around Downtown, limit the amount of new spaces to that which cannot be reasonably accommodated by transit and locate long-term facilities in areas peripheral to the Downtown Commercial District". The project site is within the Downtown Core as mapped (Map A) in the revised Downtown Transportation Plan. As no off-street parking would be provided, the project would be in compliance with the revised Downtown Transportation Plan.

TRANSIT IMPACTS

An assessment of the transit impacts of the project was conducted by adding the project-generated increases to the conditions expected to occur in late 1981 when the building would be completed. The 1981 base conditions were projected using growth factors for transit patronage based upon past system operating records. A separate growth factor was applied to each transit agency similar to the method used in the traffic analysis (for further discussion, see Appendix F, p. 163). Table 14 shows the 1981 base levels and the project-generated transit trip ends. The percent of total 1981 capacity used by the projected demands are also shown. Planned increases in capacity by Muni Metro, BART and the Golden Gate Transit Ferry were considered (see Appendix F, p. 164). The project-generated increases would not statistically lessen the level of operation of the various transit agencies involved. If the planned capacity increases did not occur, the capacities shown in Table 7, p. 41 for the affected agencies would be expected to remain in effect. Division of Table 14 ridership by Table 7 capacities would give the percent occupancy conditions resulting from no capacity increases.

The Muni 5-Year Plan, currently being implemented, would change the route characteristics of the Muni lines considered in the transit analysis. Most of the J, K, L, M and N streetcar lines would be moved underground into the Market Street Subway and become the Muni Metro system. Vehicle capacity would be increased when the streetcars are replaced by the Metro Light Rail Vehicles (see Appendix F, p. 164). Other capacity changes would occur on the 38-GEARY and 38L-GEARY LIMITED when the existing motor coaches are replaced by articulated coaches as proposed by the 5-Year Plan. The 38X-GEARY EXPRESS is proposed to be changed to the 38AX and the 38BX which would provide zoned express service to the areas now served by the 38X. The 41-UNION trolley coach line would be moved to Stockton St. and would replace the 45-GREENWICH line which would be discontinued. The existing route of the 41-UNION would be used by a new line, the 20-COLUMBUS, and by the 45X-GREENWICH EXPRESS (peak hours only). The 1-CALIFORNIA would be extended into the project area and would provide service to the Transbay Terminal. The downtown portion of the 72-SUNSET line would be discontinued upon implementation of the Muni Metro

TABLE 14: 1981 PROJECTED TRANSIT CHARACTERISTICS - P.M. PEAK-HOUR OUTBOUND ONLY

Agency	Existing		1981 Base*		1981 Base + Project		
	Ridership	% Occupancy	Ridership	% Occupancy**	Ridership	% Occupancy**	% Increase***
Muni	13,560	81	16,580	62	16,880	64	2
BART							
Transbay	7,600	76	8,880	76	8,910	76	-
Westbay	5,900	71	6,890	69	6,910	70	-
A-C Transit	8,590	70	8,590	70	8,630	70	-
Sam Trans	610	63	740	76	760	78	3
SPRR	4,300	39	5,250	48	5,260	48	-
Golden Gate							
Motor Coach	4,480	69	5,240	81	5,260	81	-
Ferry	1,190	57	1,390	49	1,400	49	-
Harbor							
Carriers	345	49	400	58	403	58	-

*The 1981 Base condition is expanded from 1978 ridership through the use of growth factors (see Appendix F, p. 158).
**Percent of total capacity occupied; capacity increases have been included in 1981 Base and 1981 Base + Project.
***Percent increase in ridership of 1981 Base + Project over 1981 Base.

SOURCE: See Appendix F, p. 158, and Table 7, p. 41.

Service. Lines 5, 6, 7, 8, 31, 71 and 61 would continue to use the existing routes with relatively few changes. The 62-CALIFORNIA-HYDE, a new cable car line going from the Ferry Building to Hyde and Beach Sts. has been proposed. The changes would affect the ridership distribution on the lines analyzed. The Muni Metro capacity increases have been considered in the transit analysis. The other changes proposed in the 5-Year Plan would increase the availability of transit service in the project area beyond that shown in the analysis.

PEDESTRIAN IMPACTS

The project population would increase the amount of peak-hour pedestrian travel on the sidewalks surrounding the project site. The project would add 140 pedestrians per hour to the existing flows on Sacramento and Battery Sts. The sidewalks surrounding the project site would be wide enough to accommodate the increased flows, as shown by the unchanged levels of service in Table 15. The morning pedestrian volumes generated by the project would be comparable to the afternoon peak, although not as intense. Noon-hour flows from the project would be lower than peak-hour flows and would be more uniformly distributed over the sidewalks fronting the site. The main impact of the increased pedestrian flows would be longer queues at the crosswalks. The walking distances from Battery St. to Sacramento St. would be shortened by the open pedestrian way through the first floor of the building.

CUMULATIVE TRAFFIC IMPACTS

As Downtown San Francisco is currently experiencing an increase in office-building floor area, the Department of City Planning has initiated an analysis of the cumulative traffic impact in the vicinity of the project. A list of the buildings completed and approved since 1976 or now subject to environmental review which are included in the analysis and a description of the methodology used in this report is included in Appendix F, p. 161. See Appendix I, p. 170, for an alternative method of analyzing the traffic impacts of cumulative Downtown office growth using data from the draft Projections 79 estimates, published by ABAG, the Association of Bay Area Governments and for a discussion of the applicability of these data.

TABLE 15: PEDESTRIAN IMPACTS OF PROJECT, AFTERNOON PEAK 15-MINUTE PERIOD

Sidewalk	Volume* Existing	Projected Increase	Total	Rate**	Level of Service***
Battery	330	140	470	3	A
Sacramento	80	140	220	3	A

*Number of pedestrians during a 15 minute period.
**Pedestrians per foot of sidewalk width per minute.
***Level of Service is measured at mid-block. For definition of Levels of Service, see Appendix F, Table F-2, p. 160.

SOURCE: TJKM, Traffic Engineers.

The 4 streets which serve as feeders to or from freeway ramps (Main, Beale, Clay and Washington Sts.) are the points of maximum automobile traffic concentration in the Financial District. They would determine the worst-case, or greatest traffic impacts. Impacts on other streets would be less, as traffic would be more dispersed. The projected traffic volumes for 1981 are shown in Table 16. Cumulative traffic would increase peak-hour volumes on the streets analyzed by from 34% to 150%; these are statistically significant changes./7/ The percentage increase caused by the project above the cumulative traffic is estimated to be not more than 3% on any of the freeway approach streets; this is not a statistically significant change./7/

The cumulative impact on peak-hour street capacities is shown in Table 17, p. 85. Cumulative traffic would decrease the Level of Service at the intersections of Mission St. with Beale St. and Main St. from C or D to F (jammed) conditions and would reduce the Level of Service at the intersection of Battery and Washington Sts. from C to E. The Level of Service at the intersection of Clay and Front Sts. would not decrease below C. The impact of the project in relation to the cumulative impacts would be a marginal lessening of the level of traffic operation on the street system.

TABLE 16: CUMULATIVE TRAFFIC IMPACTS IN 1981

	Existing (vehicles)		1981 Base* (vehicles)		1981 Base + A* (vehicles)		% Increase***		Base + A + B* (vehicles)		(% Increase)	
Street	24-Hr	Peak Hr**	24-Hr	Peak Hr**	24-Hr	Peak Hr	24-Hr	Peak Hr	24-Hr	Peak Hr	24-Hr	Peak Hr
Beale	8,000	980	8,400	1,100	14,000	2,700	68	150	14,400	2,770	3	3
Main	13,400	1,520	14,300	1,600	19,500	3,100	37	92	19,900	3,180	2	2
Clay	29,200	2,290	30,300	2,400	33,700	3,200	11	34	34,100	3,250	1	2
Washington	15,600	1,970	16,200	2,000	19,700	2,800	22	37	20,100	2,900	2	2

*Base = Expanded 1976 vehicle volumes (see Appendix F, p. 158).
A = Vehicle volumes from buildings considered in cumulative analysis.
B = Vehicle volumes from the proposed Daon Building.
**The peak hour for Beale and Clay Sts. occurs during the peak period between 4:00 and 6:00 p.m. The peak hour for Main and Washington Sts. occurs during the peak period between 7:00 and 9:00 a.m.
***Percent increase of 1981 + A over 1981 Base; percentage may not be directly derived from Table due to rounding. The percent increases represent the fractional change over the comparison volume. The percent increase was calculated by dividing the incremental increase between 2 conditions by the earlier condition, i.e., (1981 Base + A - 1981 Base) divided by 1981 Base x 100% = percent increase of 1981 Base + A over 1981 Base.
+Percent increase of 1981 + A + B over 1981 + A; percentage may not be directly derived from Table due to rounding.

TABLE 17: CUMULATIVE TRAFFIC IMPACTS - PROJECTED PEAK HOUR* VOLUME-TO-CAPACITY RATIOS**

Street	Existing	1981 Base	1981 Base + A***	1981 Base + A + B****
Clay and Front	0.57	0.59	0.73	0.75
Battery and Washington	0.72	0.74	0.91	0.92
Mission and Beale	0.69	0.71	1.10	1.11
Mission and Main	0.71	0.74	1.09	1.11

*The peak hour for Beale and Clay Sts. is during the p.m. peak period. Peak hour for Main and Washington Sts. is during the a.m. peak period.
**This is the existing or projected volume/service volume ratio at Level of Service E (see Appendix F, Table F-1, p. 162 for definition of the Levels of Service).
***A = Cumulative buildings addition.
****B = Proposed Daon building addition.

SOURCE: TJKM, Traffic Engineers

CUMULATIVE PARKING IMPACTS

The parking demand for each of the projects included in the cumulative analysis, as derived from the EIR's cited in Appendix F, p. 158, and the loss or gain of parking spaces since 1976 in the area bounded by Jackson St., Sansome St., Market St. and The Embarcadero (see Figure 18, p. 34), were compiled to produce the demand and deficit figures shown in Table 18. It is estimated that the cumulative impact would produce a parking deficit of 5,480 spaces in 1981. Eleven of the 20 buildings analyzed would provide no off-street parking. It is estimated that the project would increase the parking deficit by approximately 9% over the cumulative condition; this is not a statistically significant increase./7/

CUMULATIVE TRANSIT IMPACTS

An analysis was made, parallel to the cumulative parking and traffic analyses, of the cumulative transit impacts due to development in Downtown San Francisco (see Appendix F, p. 163). The transit analysis covered the peak 1-hour during the peak period for each agency. During the peak-hour, the demand on

TABLE 18: CUMULATIVE PARKING IMPACTS - PROJECTED OFF-STREET PARKING DEMAND IN 1981

	Cumulative	Daon Building	Cumulative Plus Daon Building
Available Spaces in 1976	570 spaces	570 spaces	570 spaces
Net gain (loss) of 1976 spaces	(60) spaces	(60) spaces	(60) spaces
Available Spaces in 1981	510 spaces	510 spaces	510 spaces
Projected Parking Demand	7,530 spaces	630 spaces	8,160 spaces*
Net Parking Surplus (Deficit)	(7,020) spaces	(120) spaces	(7,650) spaces

*Not counting that from growth other than the projects considered in the cumulative traffic analysis.

individual routes varied from less than seated capacity to total capacity. Based on existing transit data it is reasonable to assume that, for short periods of time (15 to 30 minutes), certain routes experience loadings nearer to 100% of total capacity than the loadings shown in Table 19. The loadings shown are the results of summing ridership of full vehicles with partially empty vehicles, thus equalizing the loads over the 1-hour period. As the cumulative demand increases, the length of time of peak loadings will increase, thus forcing a spreading of peak-of-the-peak conditions over time. It is not possible to quantify the extent to which peak-of-the-peak conditions would be increased, because the bunching of transit vehicles varies from day to day. The routes most likely to be overloaded for short periods are the Muni lines, the Golden Gate Transit Motor coaches and BART transbay trains.

The only agency projected to operate at greater than 90% of total capacity during the 1-hour peak period is SamTrans. The disproportionate overrun of the SamTrans capacity is due to the newness of the service, resulting in a lack of historical growth data which could be used for accurate growth projections. The method of increasing the capacity of the transit systems for the 1981 analysis made in this EIR considered only definite capacity increases (i.e., well documented). SamTrans is currently operating at approximately 60% of total capacity on the mainline routes, clearly covering the demand. The

Analysis of the results shows close correlation with the regional percentages shown in Table 11, p. 74, although a greater percentage (67%) live in San Francisco. Since San Francisco Federal Savings and Loan Association would occupy only 20% of the total space in the building, the general patterns cited above were used rather than expanding a specific travel pattern from this minority of the building users.

/6/ To calculate auto driver trips from total person trip ends in autos, use the following equation:

$$\frac{\text{total person trip ends in autos}}{\text{1.4 persons/ (auto) x (2 trip ends)/ trip}} = \text{auto driver trips}$$

The occupancy rate of 1.4 is from the Downtown Traffic and Parking Study (San Francisco Department of Public Works, 1970).

/7/ In the judgment of the TJKM traffic engineers (in the light of uncertainties, the quality of the available data, and the type of trip-generation model used), the overall accuracy of the travel demand projections is in the range of ± 10-15%. Therefore, a change of less than 10% is statistically insignificant.

/8/ The SamTrans service to downtown San Francisco was initiated in July of 1977 and as such does not lend itself to any type of refined growth projections. The mainline routes to downtown San Francisco were grouped by SamTrans with a block of routes for projection purposes; hence, the overall projections for the group of routes do not exactly reflect the ridership changes on a single route.

G. AIR QUALITY

PROJECT AIR QUALITY IMPACT

Two types of air quality impacts would result from the proposed project: short-term construction impacts, including particulate and hydrocarbon emissions, and long-term vehicle-related impacts, including carbon monoxide (CO) emissions.

Demolition, earthmoving and construction activities would affect local air quality, especially particulate (dust) concentrations, for approximately 1.5 years. In contrast to gaseous pollutants and to small-size particulate from combustion, a large fraction of particulate from construction settles out of the atmosphere rapidly with increasing distance from the source and generally does not penetrate to the lungs. It has been estimated that the small-size

(less than 30 microns in diameter) fraction of construction particulate, which may remain suspended indefinitely and is a health hazard, is generated at the rate of 1.2 tons per acre per month of activity./1/ This would include emissions from excavation and earthmoving, traffic on unpaved surfaces, wind erosion and construction of structures. Without mitigation, this rate could result in a worst-case 24-hour concentration of approximately 5,500 micrograms per cubic meter (ug/m^3) at and adjacent to the site during the excavation and earthmoving phases. This would be 55 times the State 24-hour standard of 100 ug/m^3.

The use of oil-based paints would generate hydrocarbon emissions, typically 500-700 grams per liter of paint used. Hydrocarbon emissions are important because they react with nitrogen oxides in the presence of sunlight to form ozone (smog). Regulation 9 of the BAAQMD prohibits the sale and application of: architectural coatings after 2 September 1979 that contain more than 250 grams per liter of volatile organic compounds (VOC), except that interior coatings shall contain not more than 350 grams; and any architectural coating after 2 September 1980 that contains more than 250 grams per liter of VOC./2/

After occupancy of the completed project, automobiles would be used for about 47% of the person-trips generated by the facility. All of the affected streets would experience a traffic increase of less than 7% (see Section IV.F., p. 77, for traffic volumes in the air quality analysis). Roadside CO concentrations would be increased in the immediate vicinity of the site by the computed addition of 400 vehicles per day to Beale St. This is the largest percentage traffic increase due to the project. Current (1978) CO concentrations on Beale St. between Market and Mission Sts. are estimated to be approximately 22.6 parts per million (ppm) and 10.3 ppm during the peak hour and peak 8 hours, respectively./3/ In 1981 CO concentrations on Beale St. would be approximately 16.5 ppm and 7.8 ppm during the peak-hour and peak 8-hours respectively, without the project; and 16.9 ppm and 7.9 ppm respectively, with the project. The Federal CO standards are 35 ppm for 1 hour and 9 ppm for 8 hours.

Clay St. between Front and Davis Sts. did have in 1978, and is expected to have in 1981, the highest traffic volumes and would have the highest CO levels

in the area. Concentrations in 1978 are estimated at 31.9 ppm and 13.2 ppm during the peak-hour and peak 8-hours, respectively. In 1981, they would be approximately 23.6 ppm and 10.1 ppm, respectively, without the project, or 67% and 123% of the Federal 1-hour and 8-hour standards, respectively. With project-generated traffic, these concentrations would be 23.9 ppm and 10.2 ppm, respectively, or 68% and 113% of the standard. Thus, although the project would not of itself cause violations of the standards, it would increase concentrations./3/

The building would also generate pollutants from the combustion of natural gas for heating and hot water. Table 20 compares project-generated traffic and building operation emissions to total emissions in the 9-county Bay Area.

CUMULATIVE AIR QUALITY IMPACT

The cumulative effect of recently proposed major construction on CO in the Downtown area (see Appendix F, p. 161, for discussion of buildings analyzed) was estimated./3/ The results of the analysis are shown in Table 21. Clay St. would experience continued violations of the 8-hour standard, and Beale St. would approach the 8-hour standard.

The CO concentrations in 1981 on Beale and Clay Sts., including the project and other major construction, would be 17% and 19% lower respectively than in 1978 during the more-restrictive 8-hour averaging time. These reductions would be due to emission controls on vehicles mandated by the state and federal governments, assuming the mandated controls do not change.

In summary, cumulative Downtown development would add to local and regional accumulations of CO, hydrocarbons and nitrogen oxides (the latter 2 being precursors of ozone), particulates, and sulfur oxides during adverse meteorological conditions such as inversions. The recently adopted regional Air Quality Plan/4/ found that ozone would continue to be a regional problem in the future, and that substantial reductions in hydrocarbon emissions would be necessary to attain and maintain the ozone standard in the Bay Area. CO and particulates are also problems on a local scale. Because the development would increase emissions of hydrocarbons, CO, and particulates, attainment of the standards would be impeded.

TABLE 20: 1981 DAILY PROJECT-GENERATED EMISSIONS (TONS/DAY)

	Vehicular Fuel Combustion*	Natural Gas Combustion**	Total Project Emissions	Estimated Regional Emissions*** 1985	2000
Carbon Monoxide	0.485	negligible+	0.485	4,010	5,660
Hydrocarbons	0.042	negligible+	0.042	800	1,060
Nitrogen Oxides	0.052	0.001	0.053	690	720

*BAAQMD, 1979, EMFAC-5, Vehicular Emission Factors.
**This category includes emissions from heating and hot water and other building operations. U.S. EPA, 1977, Compilation of Air Pollutant Emission Factors, AP-42 Third Edition, p. 1.4-1---1.4-3. Research Triangle Park, N.C.
***Association of Bay Area Governments (ABAG), BAAQMD, MTC, 1979 Bay Area Air Quality Plan, pp. 62-64. The region is the 9-County Bay Area Air Quality Management District.
+"Negligible" denotes emissions less than 0.001 tons per day.

SOURCE: Environmental Science Associates

TABLE 21: CUMULATIVE ROADSIDE CARBON MONOXIDE CONCENTRATION IMPACTS - PARTS PER MILLION (PPM)/3/

Streets	1978	1981 Base Case	1981 Plus Other Buildings	1981 Plus Other Buildings and Daon Building
Beale (between Market and Mission)				
Peak 1-hour (Standard = 35 ppm)	22.6	16.9	25.1	25.4
Peak 8-hour (Standard = 9 ppm)	10.3	7.8	8.5	8.5
Clay (between Front and Davis)				
Peak 1-hour (Standard = 35 ppm)	31.9	23.5	27.6	28.9
Peak 8-hour (Standard = 9 ppm)	13.2	10.3	10.7	10.7

NOTES - Air Quality

/1/ U.S. Environmental Protection Agency (U.S. EPA), 1975, Compilation of Air Pollutant Emission Factors, Supplement #5, p. 11.2.4-1.

/2/ Bay Area Air Quality Management District, Regulation 9, Rule for Architectural Coatings, adopted 1 March 1978.

/3/ CO calculations were made for the worst-case poor-dispersion meteorological conditions according to the BAAQMD Guidelines for Air Quality Impact Analysis of Projects, 1975, updated for 1979 emission factor revisions. Background concentrations were assumed, on the basis of the average of the second-highest concentrations recorded over the past 3 years, to be 15.7 ppm (1-hour) and 9.1 ppm (8-hour) in 1978, and 11.3 ppm (1-hour) and 6.9 ppm (8-hour) in 1981.

/4/ Association of Bay Area Governments, BAAQMD, and Metropolitan Transportation Commission, January 1979, 1979 Bay Area Air Quality Plan, San Francisco Bay Area Environmental Management Plan.

H. NOISE

The potential noise impacts associated with this project are of 3 types: 1) impact of the existing noise environment on the proposed use of the site; 2) impact of noise generated by the use of the site on adjacent development; 3) impact of construction noise on adjacent development. A complete discussion of fundamental acoustical concepts is available for public review at the Department of City Planning, Office of Environmental Review, 45 Hyde St., Room 319.

COMPATIBILITY WITH EXISTING NOISE LEVELS

The City of San Francisco has adopted guidelines for determining the compatibility of various land uses with different noise environments (Environmental Protection Element of the San Francisco Comprehensive Plan, adopted by City Planning Commission Resolution No. 7244, 19 September 1974, p. 19). For office use the guidelines require no special noise control measures in an exterior noise environment of up to an L_{dn} of 70 dBA. The existing exterior L_{dn} levels at the site are estimated to be 64 to 78 dBA. For these levels, the guidelines require an analysis of noise reduction

requirements and inclusion of noise insulation features in the building design. As the building would be climate-controlled, the expected interior L_{dn} noise levels would be approximately 44 to 58 dBA, 20 dBA below the outside noise level. Noise generated by machinery and office activities within the building would not increase these levels. Noise from individual trucks and buses passing the site would exceed the interior L_{dn} by up to 14 dBA. Generally, noise levels above 60 dBA would interfere with normal speech.

NOISE IMPACTS ASSOCIATED WITH THE PROPOSED USE

After the structure is built and occupied, local noise levels could change in 2 ways: noise due to increased traffic generated by the project and mechanical equipment noise.

The amount of traffic generated by operation of the project during any hour of the day would cause traffic noise levels to increase by less than 1 dBA. A 1-dBA increase in environmental noise is undetectable by the untrained human ear. No noise impact associated with increased traffic would therefore be expected.

The mechanical equipment to be used in the structure has not yet been chosen. Historically, mechanical equipment in buildings has increased environmental noise levels in downtown San Francisco./1/ Mechanical equipment noise is regulated by the San Francisco Noise Ordinance, Section 2909, "Fixed Source Noise Levels"(San Francisco Municipal Code, Part II, Chapter VIII, Section 1, Article 29, 1972). The project site and surrounding area are zoned C-3-O. In the C-3-O zone, the ordinance limits equipment noise levels to 70 dBA between 7 a.m. and 10 p.m. and 60 dBA between the hours of 10 p.m. and 7 a.m. at the receiver's property line. During lulls in the traffic, mechanical equipment generating 70 dBA would dominate the site noise environment. If equipment noise were to be limited to 60 dBA to meet the nighttime limit, it would be inaudible.

CONSTRUCTION NOISE IMPACT

Construction of the Daon Building would include about 8 weeks of foundation piledriving with an impact-type (hammer) piledriver. Conventional unmuffled and unshielded piledrivers emit noise levels of 100 to 110 dBA at a distance of 100 ft. each time the driver strikes the pile. The quietest piledriver measured by the City emits 92 dBA at 100 ft., but is not always compatible with structural engineering requirements of the building. Assuming noise emissions of 100 dBA at 100 ft. piledriving would be audible to people on the streets within 1,000 ft. of the project site, where not shielded by intervening buildings. This would include the open-air restaurant on the northeast corner of Battery and Sacramento Sts. Open windows are sometimes required for ventilation in the buildings across Battery St. from the project site. Noise levels in these buildings would reach 80 to 85 dBA. Noise levels this high would require that the office workers either shut the windows or shout to communicate and would be expected to distract workers to a degree that would degrade their performance. Vibrations from piledriving would also cause discomfort. In those buildings with fixed windows facing the project site across Sacramento St. piledriver noise levels would be 60 to 65 dBA. This level would interfere with normal speech at distances beyond 3 ft. and would be annoying and distracting.

The San Francisco Noise Ordinance (Section 2907c) limits noise emissions from tools and equipment to 80 dBA at a distance of 100 ft. unless the Director of Public Works has approved intake and exhaust mufflers and shields or shrouds which accomplish maximum noise attenuation. To date, no muffled and/or shielded piledriver has been approved for use in San Francisco. Thus, use of any impact-type piledriver would be in violation of the Ordinance. However, the Department of Public Works allows piledriver operation under certain conditions, which may include specification of a relatively quiet piledriver to be used, predrilling of pile holes, and specification of hours of operation to reduce the number of people exposed./1/

The Noise Ordinance (Section 2907b) also limits noise emissions from any powered construction equipment to 80 dBA at a distance of 100 ft. Adherence

to this limit would ensure that this type of equipment would cause noise levels at the nearest building to be no greater than present maximum noise levels due to traffic and other mechanical equipment.

Trucking of construction materials to and from the site would not cause a noticeable increase in noise levels along haul routes, because of existing traffic noise levels on the streets.

NOTE - Noise

/1/ C. Brady, Senior Mechanical Engineer, Department of Public Works, telephone communication, 18 December 1979.

I. ENERGY

Pacific Gas and Electric Company (PG&E) would provide natural gas and electricity to the proposed project through its existing distribution systems. Traffic disruption resulting from utility connections would be limited to Battery and Sacramento Sts. on the perimeter of the site./1/

The project would require an unknown amount of energy for demolition of the existing structures, excavation, and the removal of the excavated materials and rubble to a disposal site. During construction, it is estimated that about 31,000 gallons of vehicle fuel would be used, about 2.4 billion British Thermal Units (BTU) - at source./2/ Energy would be necessary to fabricate the materials used in the structure and to transport workers to and from the site.

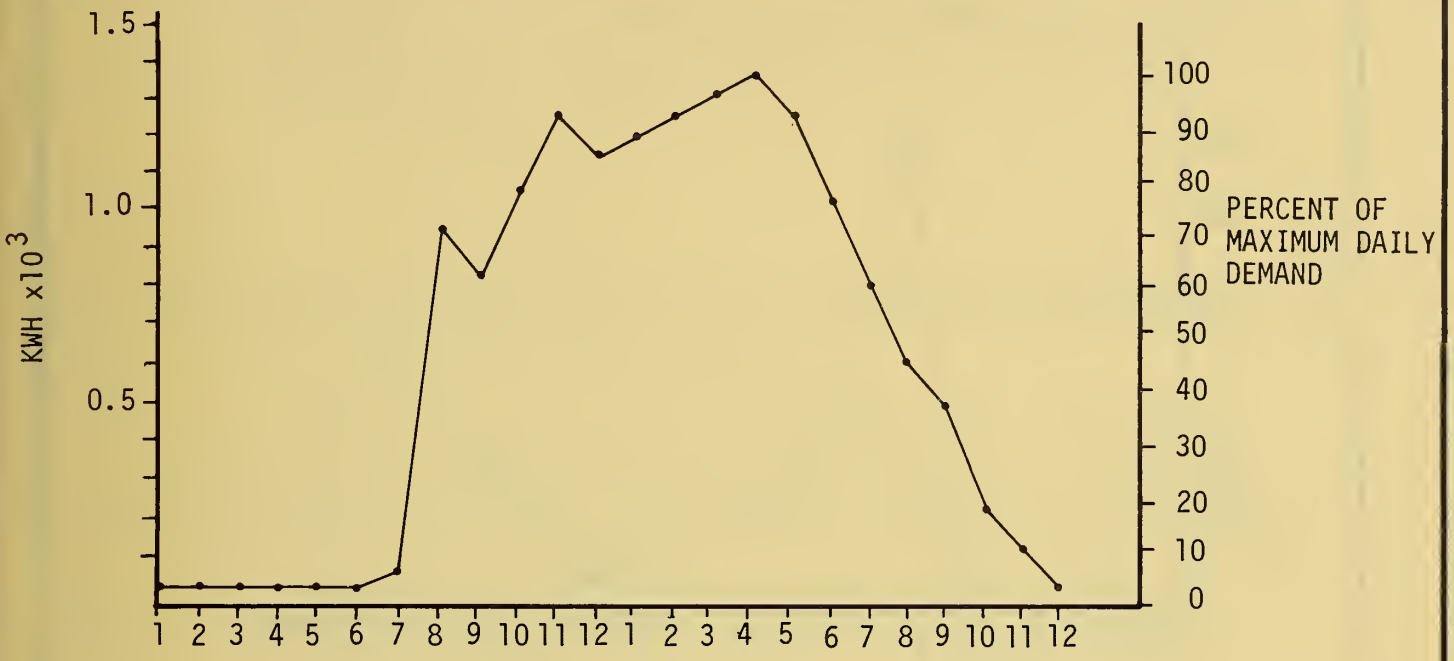
The structure would be designed to meet or exceed the minimum State energy efficiency standards./3/ Heating would be supplied by a natural-gas-fired boiler; the hot water would be pumped to reheat boxes in the ventilation system. The ventilation system would be a variable-volume, multi-zone, duct system which would have an economizer cycle that would take in outside air in excess of the minimum requirement when the outside air was of a desirable temperature; this would reduce air-conditioning. The air-conditioning system would be a central centrifugal chiller coupled with a cooling tower.

The operation of the structure would require about 4.7 million kilowatt hours of electric energy per year (48 billion BTU-at source), used primarily for ventilation and cooling. This would be the same amount of electricity as is used by 1,400 average residential customers in San Francisco./4/ The structure would have a connected kilowatt load of approximately 3,500 KW and would have an average monthly consumption of about 0.4 million kilowatt-hours, or about 1.3 kilowatt-hours per sq. ft. per month. For comparison, new high-rise structures at 333, 444 and 595 Market St. in San Francisco have projected electric consumption rates of 1.4, 1.8 and 2.5 kilowatt hours per sq. ft. per month, respectively. Daily and annual electric demand curves are shown in Figure 26. Peak consumption would occur on September afternoons.

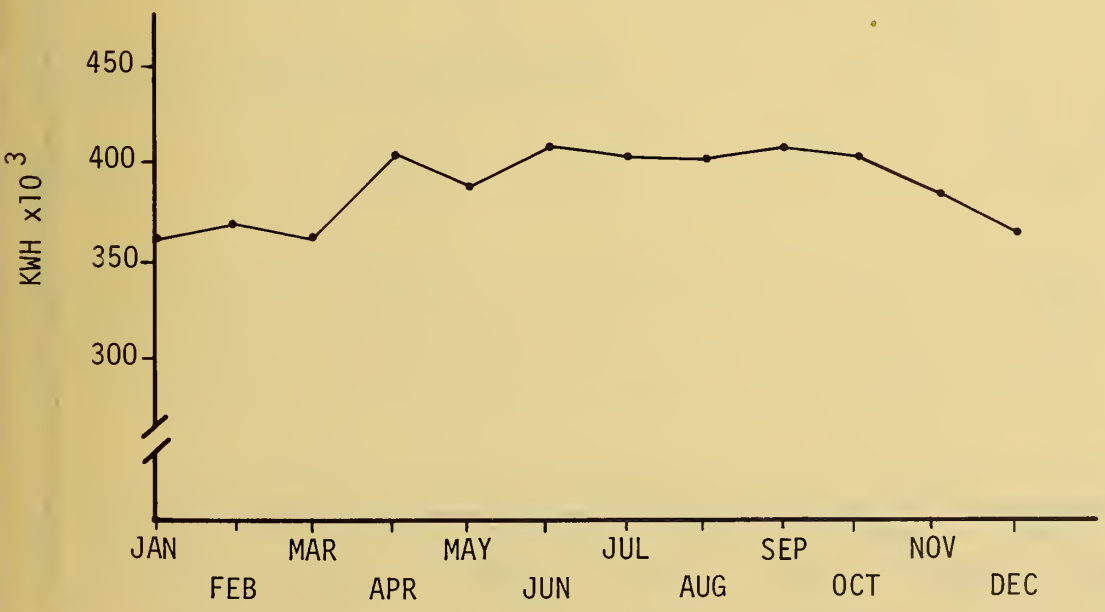
This would not coincide with Pacific Gas and Electric Company's (PG&E) system-wide (northern California service area) peak demand period in August.

The project would require about 3.1 million cu. ft. of natural gas per year (3.5 billion BTU-at source) used primarily for space heating. This would be about the same amount of natural gas as is used annually by 30 average residential customers in San Francisco. This would be an average of about 0.26 million cu. ft. of natural gas per month, or about 45 BTU per sq. ft. per day. For comparison, the new high-rise structures proposed at 333, 444 and 595 Market St. have projected natural gas use rates of 137, 120 and 300 BTU's of natural gas per sq. ft. per day, respectively. Daily and annual natural gas demand curves are shown in Figure 27. Peak consumption of 350,000 BTU's per hour would occur at 8 a.m. on weekday mornings in January. The peak demand for natural gas would not coincide with the PG&E system-wide peak demand which occurs in the early evening hours in January.

It is estimated that vehicle fuel use for traffic generated by the project would be about 190,000 gallons of gasoline per year (about 47 billion BTU-at source). This use is estimated based upon the mix of vehicles expected in 1985; actual vehicle fuel use is expected to decline until 1995 as the vehicle fleet becomes more efficient.

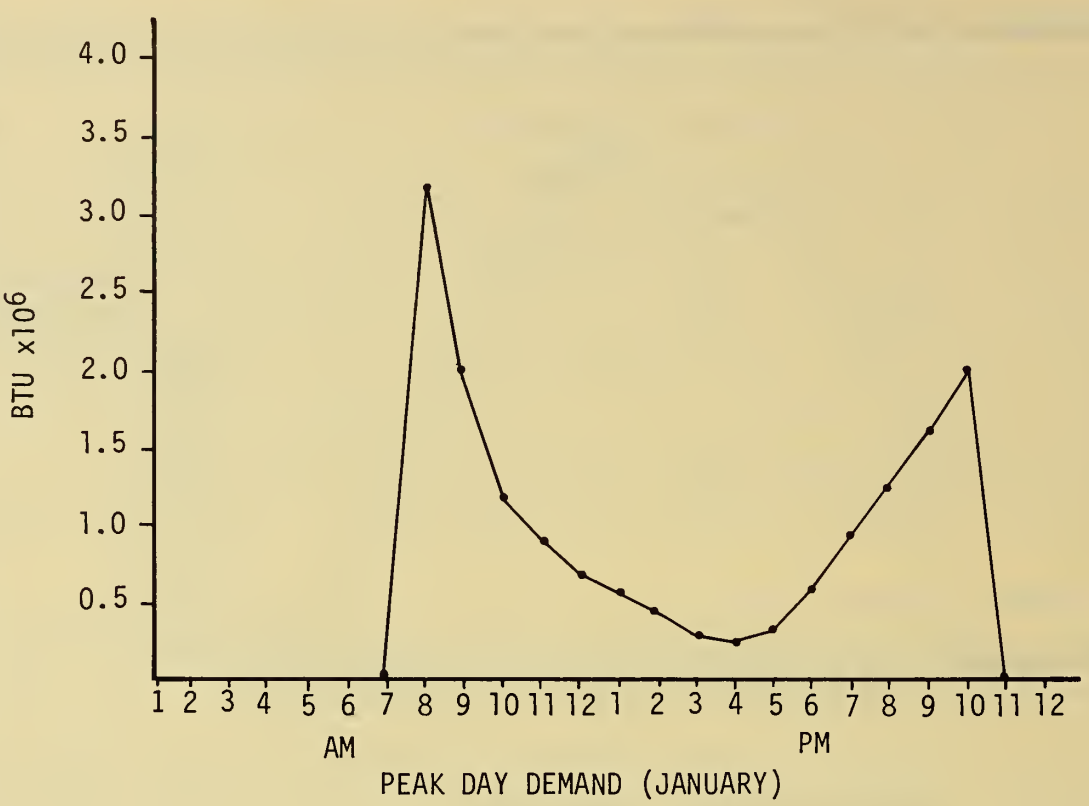


DAILY ELECTRICAL CONSUMPTION

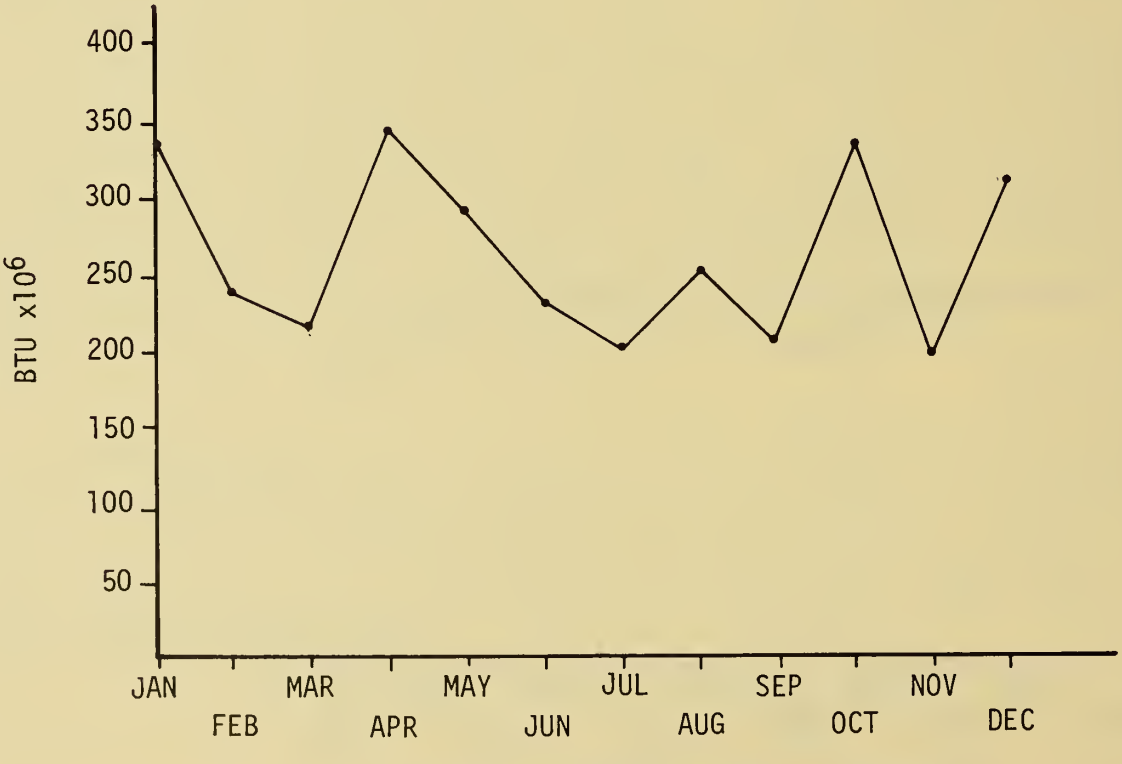


AVERAGE MONTHLY CONSUMPTION

FIGURE 26: ELECTRIC POWER CONSUMPTION PROFILES



PEAK DAY DEMAND (JANUARY)



AVERAGE MONTHLY CONSUMPTION

FIGURE 27: NATURAL GAS CONSUMPTION PROFILES

Cumulative downtown development, including the proposed project, would use approximately 23.8 million kilowatt hours of electricity per month and approximately 1,480 million BTUs of natural gas per day (see Appendix H, p. 167, for a list of buildings considered).

NOTES - Energy

/1/ K. Austin, Commercial Representative, Pacific Gas and Electric Company, letter communication, 1 May 1979. This letter is available at the Department of City Planning, Office of Environmental Review.

/2/ BTU, British thermal unit, is a unit for measuring energy. Technically, it is the quantity of heat required to raise the temperature of 1 pound of water 1 degree F at sea level. The term 'at source' means that adjustments have been made in the calculation of the BTU energy equivalent to account for losses in energy which occur during generation and transmission of the various forms of energy as specified in: ERCDC, 1977, Energy Conservation Design Manual for New Nonresidential Buildings, Energy Resources Conservation and Development Commission, Sacramento, CA; and Apostolos, J.A., W.R. Shoemaker, and E.C. Shirley, 1978, Energy and Transportation, Sacramento, CA (Project 20-7, Task 8).

/3/ State energy efficiency standards are described in ERCNC, 1977, Conservation Regulations Establishing Energy Conservation Standards for New Nonresidential Buildings (Sections 1451-1542 of Title 20 and Section T20-1451 through T20-1542 of Title 24 of the California Administrative Code).

/4/ This estimate is based on energy consumption data in ERCDC, 1976, Quarterly Fuel and Energy Summary, Vol. 2, Nos. 1 and 2.

J. GEOLOGY, SEISMICITY AND HYDROLOGY

GEOLOGY

The site would be excavated to an average depth of 15 ft.; a basement 10 ft. deep now exists. Approximately 6,800 cubic yards of material would be removed and transported to a undetermined private disposal site on the Peninsula.

A possible hazard from lateral movement of geologic materials, particularly the Bay mud, could occur during excavation of the site. A lateral movement could occur because of the exposure of a free face in the pit wall. Such lateral movement could happen at any time, but the hazard would be greatest if

the soil were saturated with groundwater or if an earthquake were to occur. This hazard is unlikely owing to the existing basement walls and the shallow (5 ft. below the basement) depth of excavation.

The foundation of the building would be designed to carry the load into firm bearing materials below the Bay mud. The sandy materials which would bear the load are relatively incompressible, so that only minor settlement is expected to occur. This factor would be taken into consideration in the foundation design (J. Meyers, Structural Engineer, Skidmore, Owings & Merrill, telephone communication, 21 May 1979).

The removal of spoils from the site could cause the spillage of silt and sand in the streets along the haul routes. A large spill would be a safety hazard for operators of vehicles, particularly motorcyclists and bicyclists. The street dirt would be a source of siltation in the storm drains and a source of dust.

SEISMICITY

Ground shaking (Blume, 1974) during a major earthquake might damage the proposed building, but probably would not cause its collapse. The building would be designed to meet the standards of the San Francisco Building Code and the more stringent standards of the seismic design code of the Structural Engineers Association of California (SEAOC). The SEAOC design standards relate the structural design to the maximum probable earthquake on the nearest fault and on a more distant fault, and to the maximum probable earthquake in the region (an 8.3 Richter magnitude event on the San Andreas Fault). The design approach would be to minimize damage and loss of life from an earthquake.

The structure would have a foundation of concrete piles and tie-beams. The building would have a welded steel moment frame with the steel columns and beams welded together. The moment frame design would be constructed to resist both wind and earthquake. According to J. Meyers, Structural Engineer at Skidmore, Owings and Merrill, the exterior would reduce the chances of glass

falling from the facade by being enclosed in a lightweight curtain-wall (telephone communication, 19 March 1979).

Ground shaking during an earthquake could cause loose interior panel walls to be thrown out, and unattached objects, such as bookcases, to topple. Fires could be ignited within the building. If liquefaction and lateral landsliding were to occur in the vicinity, local streets might buckle or crack due to lateral landsliding, accompanying liquefaction, or rapid settlement. Water mains and pipes and underground utility lines might break, leaving the building without outside water, power or telephone communication. Elevators could be made inoperable due to loss of power or damage to the elevator system. Emergency water storage and a power generator would be incorporated into the building as required by City code.

HYDROLOGY

Dewatering would be conducted at the site for an estimated 26 weeks. The water would be discharged into the storm drain system. The dewatering might produce some local subsidence in compressible geological materials such as artificial fill and soft Bay mud. Settlement of these materials might damage older brick and masonry buildings in the immediate vicinity of the site. The walls of such structures might crack or lean out of plumb and floors might be bent or tilted out of horizontal. Streets and sidewalks could develop swales, cracks or "potholes", thereby creating a potential traffic hazard. Underground utility lines, e.g. sewers, water mains, power and telephone lines, might be bent or broken by the settlement or lateral shifting of soil caused by dewatering. Because of the potentially high costs of repairs associated with such damages, the Department of Public Works generally requires that a Surety Bond be posted before issuance of permission for excavation. The construction contractor would be held responsible for any damage which might result from dewatering.

The lowering of the water table during construction is not expected to have a permanent impact on the ground water levels. Draw-down of the water table would occur within several hundred feet of the site and would decrease rapidly

with distance. Bay mud is relatively impermeable and the sea wall restricts the intrusion of saltwater into the geologic materials of the land.

Seepage might be a problem in the basement of the building. A sub-drainage system would be constructed below the basement to relieve water pressure.

K. GROWTH INDUCEMENT

The project would add about 275,000 gross sq. ft. of office space (235,000 net. sq. ft.), 5,000 gross sq. ft. of retail space (3,800 net. sq. ft.) and 7,000 gross sq. ft. of financial institutional space (4,500 net sq. ft.) to the Downtown supply, while about 43,000 gross sq. ft. of commercial space in the present buildings on Block 237 would be demolished. The prime tenant, San Francisco Federal Savings and Loan Association, is already located in San Francisco and would vacate up to 29,000 leasable sq. ft. of space in its offices on Post St. and at Kearny St. This space would then become available for other office tenants, as would space vacated by other San Francisco firms moving into the project.

It is not known to what extent employees at the Daon building would be newcomers to San Francisco, either as residents or commuters, rather than persons already residing in the City but not currently employed, or employed outside of or elsewhere in the Downtown area. Because the headquarters of San Francisco Federal Savings and Loan Association is already located in San Francisco, and the Savings and Loan would expand its administrative functions in San Francisco, few new jobs at the Savings and Loan would be considered to result from the proposed project. Rather, they would result from continued corporate growth of the company./1/

To the extent that the project attracts new residents or commuters who would not otherwise have been attracted to San Francisco or the Bay Area, it may be viewed as employment-generating and growth-inducing, resulting in a variety of indirect growth effects. These effects would include additional demand for housing in San Francisco and the region, now in short supply. Other indirect

growth effects resulting from new residents attributable to the proposed project include additional demands for a variety of commercial, social, medical, and municipal services, and secondary demands on streets, freeways and transit systems. This increased demand will have a general tendency to increase City residential rents and saless price somewhat, but in the context of uncertain future construction activity, inflation and other sources of housing demand, its influence on future housing costs cannot be stated conclusively.

According to "Changes in the San Francisco Housing Inventory" (San Francisco Department of City Planning, 1977), the City's housing stock is increasing by 1,000 to 1,500 units per year. Assuming, for worst-case analysis, that each new job would result in the formation of a new household that would want to live in San Francisco, the approximately 1,000 new jobs at the project site would generate a housing demand of 2/3-to 1-year's supply of housing starts in the City.

The 1979 Downtown San Francisco Conservation and Development Planning Program Phase 1 Study states that:

> "Continued employment growth in Downtown is likely to result in continued displacement of lower income residents and a higher rate of new housing construction. The total number of units made available by these means, however, will not be sufficient to house the increased number of Downtown employees. Therefore, the percentage of employees living in San Francisco will continue to decline."/2/

Employees who would not live in San Francisco would be expected to contribute to the demand for housing elsewhere in the region. Using the estimate based on ABAG's draft Projections 79 (see Appendix I, pp. 168) of 10% to 11% San Francisco residents, the impact on housing outside of the City would be further intensified (see Appendix I, pp. 168). The areas outside of the City which would be likely to provide housing would be Contra Costa County; Marin County, particularly Novato; and southern Alameda County, particularly Fremont./3/

The project would continue the trend toward replacement of older buildings in the Financial District with new construction, but would probably not itself

stimulate further office development near the site, as such development has already taken place or is being planned.

The project would require no new construction or extension of public service or utility systems and would occur in an already developed Downtown urban setting. It would therefore not require any infrastructural improvements that would open or intensify development opportunities that do not already exist.

Cumulatively, the project could contribute incrementally to an oversupply of downtown office space in the 1980's. Such an oversupply could have the effect of inhibiting growth in the Yerba Buena Center Redevelopment Area or other areas of the City, particularly south of Market St. An oversupply in San Francisco, should it occur, would not appreciably inhibit office development elsewhere in the Bay Area (see IV. E, p. 71).

NOTES - Growth Inducement

/1/ Net or marginal new office employment directly resulting from a particular project is difficult to determine. A theoretical assumption must be made as to whether the new employment would have occurred without the particular project. In Section IV.E. of this report, economic effects have been analyzed as gross impacts; that is, the future with the project is compared directly to the present without the project. Net impacts, in the sense of comparing the probable future without the proposed project to a future with the project, are not discussed.

/2/ Sedway/Cooke, October 1979, Downtown San Francisco Conservation and Development Planning Program Phase 1 Study, p. 48.

/3/ D. Morehead, Regional Relocation Director, Coldwell Banker, telephone communication, 25 July 1979. ABAG draft Projections 79 data also show proportionately higher increases in housing stock at these locations than other locations in the Bay Area.

V. MITIGATION MEASURES PROPOSED TO MINIMIZE THE POTENTIAL IMPACTS OF THE PROJECT

In the processes of project planning, design and coordination, a number of measures have been identified that would reduce or eliminate the potential adverse environmental effects of the proposed project. Most of these measures have been adopted by the project sponsors or are under consideration by their architects, builders, or other contractors. A few measures have been rejected. Each of these measures, and its status with respect to the proposed project, is discussed below. Where a measure has been rejected, the reasons for its rejection are also shown (see Table 22).

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
URBAN DESIGN AND VISUAL IMPACTS		
- Walking distances would be shortened through the open pedestrian way between Battery and Sacramento Sts.		- The entire savings office of San Francisco Federal Savings and Loan Association could be located on the second floor and retail areas placed on the corner of the ground floor to provide pedestrian interest. This measure was rejected because the proposed building would house the corporate headquarters of San Francisco Federal Savings and the savings office located there would be the main savings office. It is important to San Francisco Federal that the main savings office be highly visible, project an image of size and strength to the public, and be convenient for people in a hurry and the eloerly. The Savings and Loan Association does not believe that a second-floor location would meet these objectives, nor would it attract customers from off the street. (Ernest J. Piccone, Corporate Services Manager, San Francisco Federal Savings and Loan Association, letter communication, 12 June 1979. This letter is available for public review at the Department of City Planning, Office of Environmental Review.)
- The project would provide retail frontages along the pedestrian way at street level to encourage pedestrian activity, interest and movement (see Figure 7, p. 12).		
- The design of signs and graphics would be controlled to avoid a garish or distracting appearance.		
- The project would include planters on each setback level which would be planted with vines or some other greenery and seasonal flowers. This would enhance the visual quality of the setbacks from street level viewpoints along Battery and Sacramento Sts. and from surrounding buildings overlooking the site.		
CULTURAL AND HISTORIC IMPACTS		
- Should evidence of cultural or historic artifacts of significance be found during project excavation, the Environmental Review Officer and the President of the Landmarks Preservation Advisory Board would be notified. The project sponsor would select an archaeologist and/or maritime historian to help the Office of Environmental Review determine the significance of the find and whether feasible measures, including appropriate security measures, could be implemented to preserve or recover such artifacts. The Environmental Review Officer would then recommend specific mitigation measures, if necessary, and recommendations would be sent to the State Office of Historic Preservation. Excavation or construction which might damage the discovered cultural resources would be suspended for a maximum of 4 weeks to permit inspection, recommendation and retrieval, if appropriate.		

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
WIND IMPACTS	- Street trees and small structures such as kiosks for vendors could be placed along the Sacramento St. and Battery St. sidewalks to reduce windspeeds near the proposed building and provide shelter for pedestrians.	
SECURITY - A 24-hour security guard would be stationed in the lobby; there would be another security guard on duty at night. - San Francisco Federal Savings and Loan Association would provide its own security system for banking operations. - Closed-circuit TV would be used to survey the loading docks. - The project sponsor would meet with the Crime Prevention Bureau of the Police Department to discuss further security measures.		
FIRE - The project design would incorporate fire protection measures required by the San Francisco Building Code. These would include a fire alarm system and an alarm monitoring station which would be equipped to indicate the time and location of a fire, to switch on emergency power sources, and control the elevators. Other requirements would be an automatic fire detection system, a voice communications system, ventilation for smoke control, a standby power generator, an on-site water supply, and a sprinkler system. - The project sponsor would meet with the Fire Marshal to discuss the building design and proposed internal fire protection measures.		

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
WATER - Low-flow plumbing fixtures would be used to conserve water.		
SOLID WASTE - Space would be provided for storage of recyclable materials.		
TRANSPORTATION, CIRCULATION AND PARKING - Pacific Gas and Electric Company would coordinate work schedules with other utilities requiring trenching so that street disruption would take place during weekends and off-peak hours. - No on-site parking would be provided, in accordance with the revised Transportation Element of the Comprehensive Plan. - Bicycle storage would be provided, both for use by couriers and to encourage use of this alternate form of transportation by employees and visitors. - San Francisco Federal Savings and Loan Association would establish a "flextime" system of flexible arrival and departure hours for employees to reduce concentration of employees commuting during peak traffic hours. - San Francisco Federal Savings and Loan Association would establish a carpooling system for its employees. - The Daon Building management office staff would coordinate a carpooling system for the employees of firms in the building. Carpool matching (and carpool vehicles) are available under the auspices of Rides for Bay Area commuters, a non-profit organization.		

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
- In recognition of the need for public transit services to meet peak demand generated by cumulative office building development in the Downtown district, the project sponsor would participate in a Downtown Assessment District, with annual or monthly assessments, or similar nondiscriminatory mechanism, to provide funds for mass transit, should such a mechanism be established by the City.	- During the demolition and excavation period, haul trucks and delivery vehicles could enter and exit the site between the hours of 9 a.m. and 4 p.m. only, so as to avoid conflicts with peak-hour traffic. The project sponsor intends to meet with the Traffic Engineering Division of the Bureau of Engineering (DPW), the Office of Environmental Review and the Muni to determine necessary and feasible construction traffic mitigation measures which would be satisfactory to all parties. - The projected Level of Service at the intersection of Beale and Mission Sts. would be reduced to F under cumulative development conditions, exclusive of the proposed project. This could be mitigated by restriping of the Beale St. approach to the intersection. At the present time, Beale St. is striped for 3 lanes southbound. There is a bus stop on the west side and curbside parking on the east side. Sufficient width is available to restripe the approach to 5 lanes if towaway restrictions were placed on the curbside parking during peak hours. The resulting lane pattern could be 1 left-and-freeway lane, 2 freeway-only lanes, 1 through lane and 1 through-and-right lane. The Level of Service would change from F to D (volume to capacity ratio (v/c) change from 1.10 to 0.86) for the suggested pattern. Such a measure would be entirely under the jurisdiction of the Bureau of Traffic Engineering (DPW) and would be considered a possible solution at such time as the projected conditions develop.	

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
	- The critical approach to the intersection of Mission and Main Sts. is the freeway off-ramp which currently has 2 lanes northbound onto Main St. The volume of traffic projected to use these lanes in the 1981, including cumulative development but exclusive of the project, would decrease the Level of Service to F; this projected volume exceeds the carrying capacity of the approach as it is currently constructed. To increase the capacity of the off-ramp, more green time could be allocated to the appropriate phase of the traffic signal by prohibiting left-turns from eastbound Mission St. onto Main St. This measure would change the Level of Service from F to E (v/c ratio change of 1.09 to 0.97). Such a measure would be entirely under the jurisdiction of the Bureau of Traffic Engineering (DPW) and would be considered a possible solution at such time as the projected conditions develop. Further reduction in the v/c ratio would not be possible without lane additions to the off-ramp which would be under the jurisdiction of CalTrans. - Mitigation of the projected Level of Service E operation during peak hours due to cumulative development but exclusive of the project, at the intersection of Washington and Battery Sts. would be possible through restriping of the southbound approach. The approach currently is striped to carry 3 lanes of traffic (2 through, and 1 right-and-through). Use of a peak-hour towaway lane to allow 4 lanes of traffic; (3 through, and 1 right-and-through), would cause a change in Level of Service from E to D (v/c ratio change from 0.91 to 0.83). Such a measure would be entirely under the jurisdiction of the Bureau of Traffic Engineering (DPW) and would be treated as a possible solution at such time as the projected conditions develop.	

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
	- The overload that would occur on the SamTrans mainline (Bayshore Highway Route) due to cumulative development could be alleviated by additional buses, possibly by shifts in routes, and headway changes. (The San Mateo Transit District is the agency controlling the assignment of additional buses; it is controlled by funds available through its taxing and revenue system. The Metropolitan Transportation Commission is the regional administrator of Federal Urban Mass Transit funds and California funds.)	
AIR QUALITY IMPACTS		
- During the demolition and construction period, unpaved surfaces would be wetted at least twice a day with reclaimed water to hold down dust; this would reduce particulate emissions about 50%.		
- Water-based or latex paints would be used on all interior drywalls painted by the general contractor or project sponsor, rather than oil-based paints which emit hydrocarbons while drying; this would reduce hydrocarbons from drying paint by about 60%.		
NOISE IMPACTS		
- The project sponsor intends to meet with the Bureau of Engineering and the Office of Environmental Review to determine necessary and feasible migitation measures for piledriving noise which would be satisfactory to all parties.	- Piledriving activity could be limited to hours resulting in the least disturbance to neighboring uses (e.g. 4:30 p.m. to 11 p.m.). This would require a night-work permit from the Director of Public Works.	
- Holes for the piles would be predrilled to reduce noise impacts; then the piles would be driven the rest of the distance required.		
- To minimize construction noise, only muffled gasoline and diesel-powered construction equipment or electrically powered construction equipment would be used.		

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
- The mechanical equipment in the building would be muffled to comply with the City Noise Ordinance, Section 2909. - Additional noise insulation would be incorporated into the exterior walls of the building, as called for in the Environmental Protection Element of the Comprehensive Plan (p. 19). ENERGY IMPACTS - The building management would make storage containers available to tenants for collection and storage of recyclable solid wastes such as glass, metal, paper, computer cards and newspapers. GEOLOGY AND HYDROLOGY IMPACTS - Excavation pit walls would be shored up and protected from slumping or lateral movement of soils into the pit. Shoring and sheeting with soldier beams could be used for this purpose. The contractor would comply with the Excavation Standards of the California Occupational Safety and Health Agency (Department of Industrial Relations). - Battery and Halleck Sts. adjacent to the site would be swept by the demolition and excavation contractors as required by Code so that silt would not be washed into the storm drains and dust would be reduced. This would be a provision of excavation and demolition contracts. - Groundwater observation wells would be installed for monitoring the level of the water table and other instruments to monitor potential settlement and subsidence. The City would require a lateral and settlement survey to monitor any movement or settlement of surrounding buildings and adjacent streets during the dewatering. Control lines and benchmarks would be established for monitoring horizontal and vertical movement. Costs for the survey and any necessary repairs to services under the streets would be borne by the contractor.		- The loads of haul trucks carrying excavated materials from the site could be covered with a tarp to reduce dust and potential spillage onto the streets. This measure was rejected because it is not required by Code nor is it customary in San Francisco. The project sponsor has agreed to a provision of the general contract which would prohibit the overloading of trucks; this would help to reduce spillage.

TABLE 22: MITIGATION MEASURES PROPOSED TO MINIMIZE THE ADVERSE EFFECTS OF THE PROJECT (Continued)

MEAUSRES TO BE INCLUDED IN PROJECT	MEASURES RECOMMENDED AND/OR UNDER CONSIDERATION	MEASURES REJECTED (AND REASONS FOR REJECTION
- If, in the judgment of City engineers, unacceptable subsidence occurs during the construction, groundwater recharge would be begun by the general contractor to halt the settlement. This might cause a delay in construction. - Groundwater pumped from the site would be retained in a holding tank to allow suspended particles to settle, if this is found necessary by the Industrial Waste Division of the Department of Public Works, to prevent sediment from entering the storm drain/sewer lines. SEISMICITY IMPACTS - The project sponsor would build the project in compliance with the recommendations of the structural engineers and in accordance with the standards of the Structural Engineers Association of California. - As required by the San Francisco Building Code, nonstructural elements of the building, such as hanging light fixtures, hung ceiling and wall partitions, and mechanical equipment would be attached firmly in such a manner as to reduce the likelihood of their falling during an earthquake. - An emergency water supply and pumps would be provided as required by the San Francisco Building Code so that the sprinkler system would be more likely to be operable after an earthquake. This emergency measure would mitigate the potential hazard created by fires occurring at a time when the water supply may be cut off by earthquake damage to water mains.		

VI. SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROPOSED PROJECT IS IMPLEMENTED

URBAN DESIGN

The project would require demolition of 3 buildings. The buildings at 280 Battery St. and 353 Sacramento St. are included in the 1976 Architectural Inventory and rated "B" in the 1979 survey of Downtown buildings done by the Foundation for San Francisco's Architectural Heritage.

The scale of the tower would contrast with smaller-scale buildings to the east. Shadows from the tower would extend over the podium level of Two Embarcadero Center in the early afternoon during the spring and fall.

Wind speeds under northwesterly conditions would increase at the northeast corner of Halleck and Battery Sts. and near the intersection of California and Battery Sts. Westerly wind speeds would increase on Halleck and Sacramento Sts.

ECONOMICS

Eleven businesses employing about 250 persons would be displaced from the site.

TRANSPORTATION

Construction hauling would temporarily increase traffic on access streets and haul routes. Project-generated traffic would increase traffic volumes on the surrounding local streets. The percent increases in project-generated traffic above the 1981 projected base traffic volumes would range from about 2% on Battery St. to about 7% on Beale St.

AIR QUALITY

Project-generated traffic and traffic from cumulative Downtown development would increase emissions of air pollutants; attainment of the standards would be impeded.

NOISE

Construction noise would cause intermittent work interference in neighboring office buildings.

ENERGY

During operation, the project would require about 4.7 million kilowatt hours of electrical energy, generated predominantly from nonrenewable fossil fuels, and about 3.1 million cu. ft. of natural gas annually.

CUMULATIVE DEVELOPMENT

The project would contribute incrementally to the cumulative traffic, transit and air quality impacts of development now under construction and proposed in the Downtown business district.

VII. ALTERNATIVES TO THE PROPOSED PROJECT

Alternatives to the project as proposed are described and compared below.

A. NO PROJECT

This alternative, as defined by the California Environmental Quality Act, would entail no change to the site. The 3 existing buildings would be retained. 280 Battery St. and 353 Sacramento St. are rated "1" and "0", respectively, in the 1976 Architectural Inventory (Department of City Planning, 1976) and also rated "B" in the 1979 architectural and historic resources inventory prepared by the Foundation for San Francisco's Architectural Heritage.

Traffic, transit and air quality conditions described (IV.F. p. 74 and IV.G., p. 89) as 1981 Base conditions with cumulative development would exist on streets around the site. The noise environment of the area would not change. There would be no change in the demand from the site for community services. The 11 businesses now operating on the site would not have to relocate. Total composite property tax revenues would remain at about $19,000 per year and property tax revenues to the City and County of San Francisco would remain at about $16,300 per year, increasing at the 2% annual rate allowable under Proposition 13.

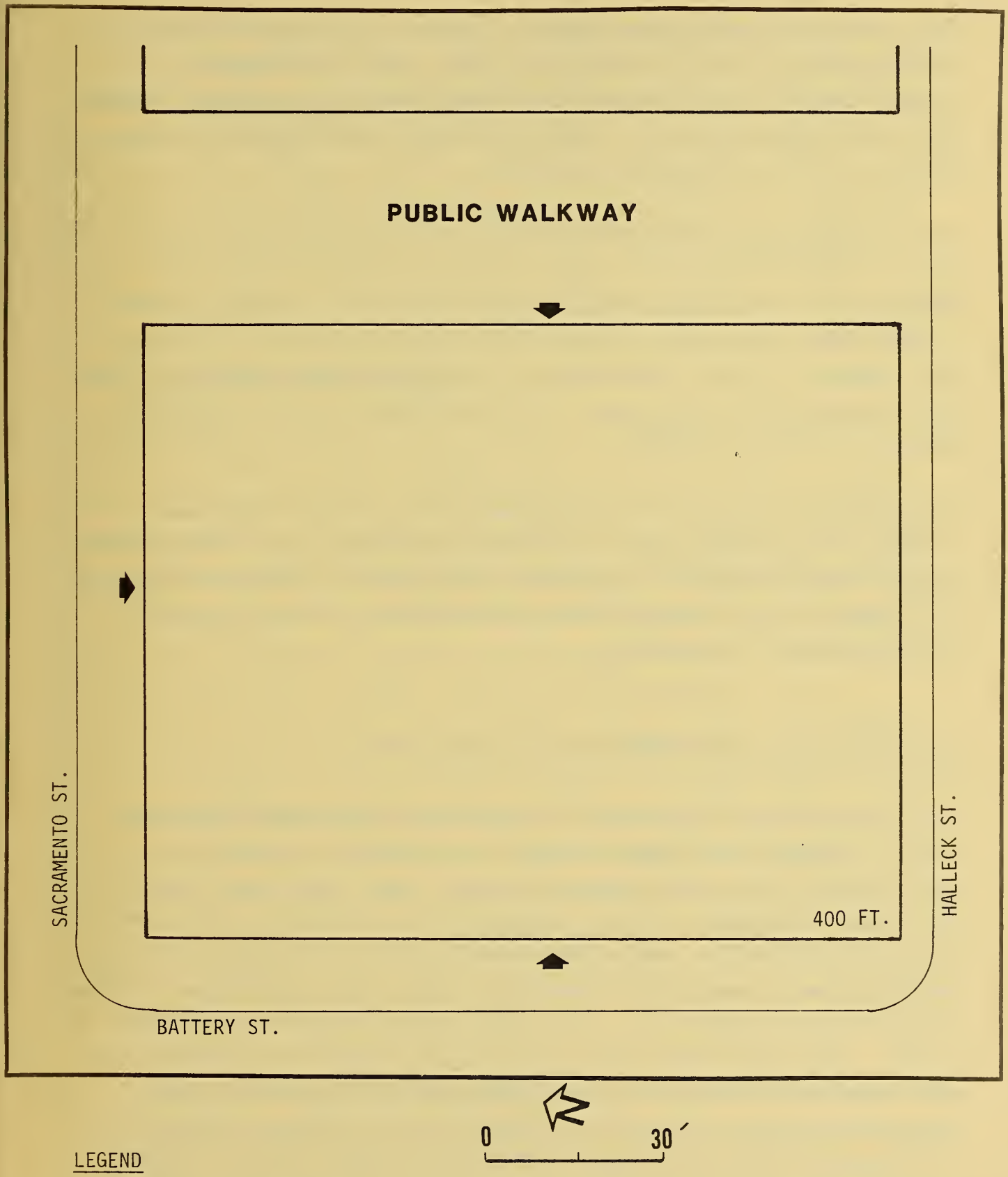
This alternative would preserve options for future development of the site. It is not acceptable to the project sponsor because it would not provide for forseeable space and operational needs of San Francisco Federal Savings and Loan Association.

B. RECTANGULAR TOWER ALTERNATIVE

An alternative design complying with the Height and Bulk District which would provide the maximum floor area permitted under the existing City Planning Code could be developed on the site. The 30-story, 400-ft.-tall structure (about 50 ft. taller than the project) would have about 355,000 sq. ft. of gross floor area (66,000 sq. ft. more than the proposed project), including about 308,000 gross sq. ft. of office space and about 12,000 gross sq. ft. of retail space and a main savings office on the ground floor. The building would be set back from the eastern property line and a 35-ft.-wide walkway would connect Sacramento and Halleck Sts. on the east side of the building (see Figure 28). There would be no open pedestrian way through the ground floor, nor would there be any setbacks at the corners. Development bonuses which would be applied to gain the increased floor area would include those for: multiple building entrances, wider sidewalks, plaza, side setback and shortened walking distance. (The bonus calculations are available for public review at the Department of City Planning, Office of Environmental Review.)

The facade would be of a lightweight material with tinted solar gray glass arranged in a horizontal pattern, similar to the proposed project. The visual interest provided by the landscaped corner setbacks would be eliminated. The bulk of the tower would be reduced when viewed from the south or north, but increased when viewed across the diagonal dimension of the structure.

Shadow effects would be similar to the proposed project; shadowing of sidewalks and the podium level of Two Embarcadero Center would be more extensive because of the increased height. As with the proposed project, wind speeds would increase near the corner of Halleck and Battery Sts., at the intersection of Battery and Sacramento Sts., and along Sacramento St. east of the building. Under northwesterly wind conditions, increases in wind speeds would be greater on Sacramento St. than with the project as proposed. The increase in westerly winds at the intersections of California and Battery Sts., Halleck and Battery Sts. and Sacramento and Battery Sts., and along Halleck St. would be greater than with the proposed project. The increase would be less along Sacramento St. east of the site than would occur with the proposed design.



LEGEND

BUILDING ENTRANCE

400 FT. HEIGHT OF BUILDING

FIGURE 28: RECTANGULAR TOWER ALTERNATIVE - SITE PLAN

SOURCE: ENVIRONMENTAL SCIENCE ASSOCIATES, INC.

This alternative would require community services and energy in proportion to its increased floor area. As with the project, the 3 buildings which currently exist on the site would be demolished and the 11 businesses located there would have to relocate. Traffic and transit travel generated by the building would be increased by about 20%.

The rectangular tower alternative would have a fair market value of about $32.1 million (in 1979 dollars), about 19% greater than the project as proposed; the assessed value would be about $8.3 million. Between $321,000 and $406,000 in total property tax revenues would be generated annually; of this, between $273,000 and $345,000 would be revenues to San Francisco. The net increase to San Francisco over existing buildings on the site would be between $257,000 and $329,000.

This alternative would result in increased office space with increased revenues to the project sponsor. It was rejected because the project sponsor believes that the design of the proposed project with 3 landscaped setbacks is architecturally more interesting and relates better to the site than the alternative rectilinear design.

VARIANT WITH THE SAVINGS OFFICE ON THE SECOND FLOOR

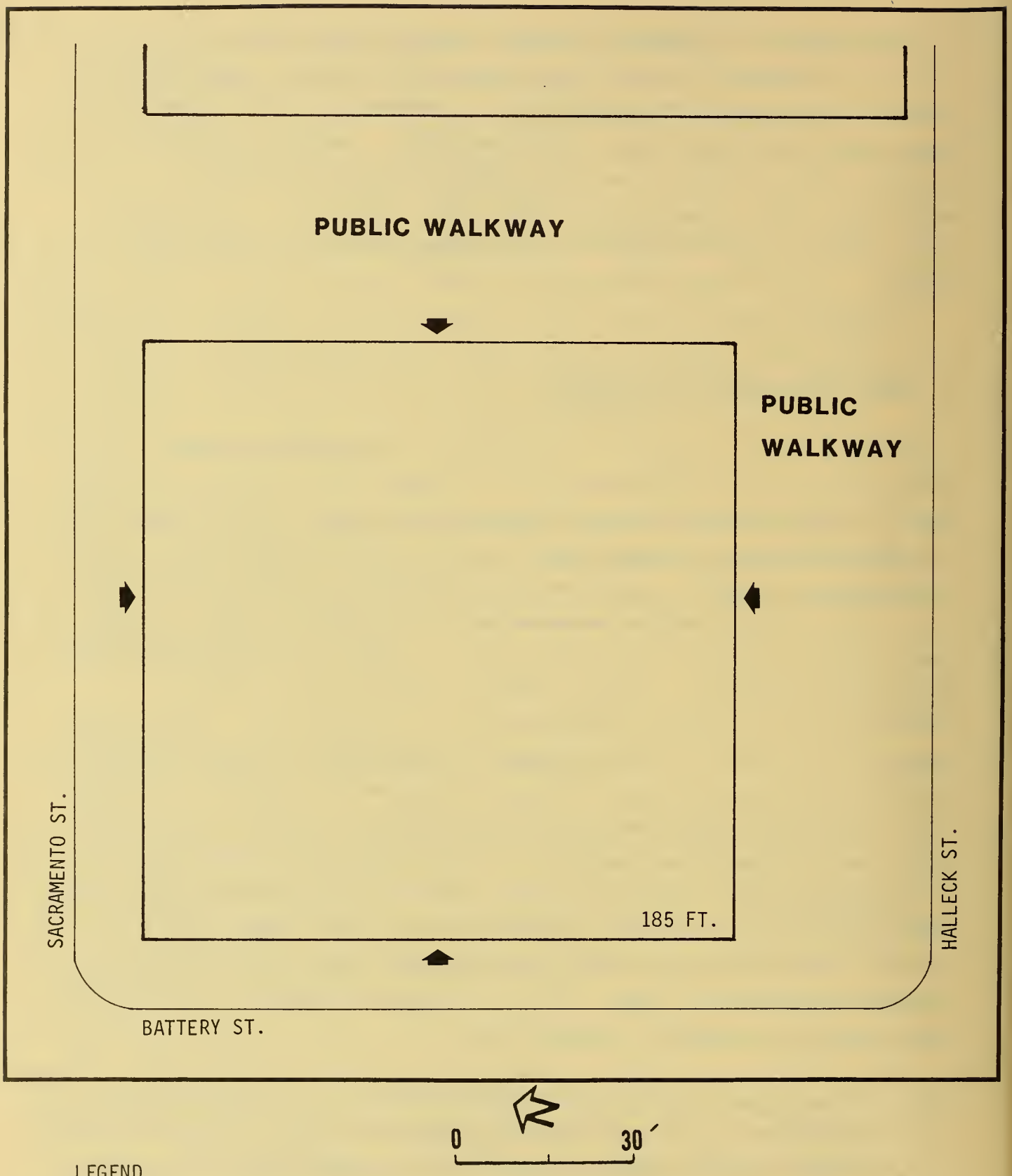
The savings office that San Francisco Federal Savings and Loan Association proposes to open in the proposed project at the corner of Battery and Sacramento Sts. could be located on the second floor; this variant would be applicable to any design for new construction on the site. Escalators would provide access from the lobby to the Savings and Loan. This would result in additional retail space on the ground floor. The retail shop windows fronting on Battery and Sacramento Sts. would provide pedestrian interest (see Table 9, p. 52). The second floor location was rejected by San Francisco Savings and Loan Association because this would be the main savings office for the Association and would be in the building housing the corporate headquarters. It is important to the Association that the main savings office be highly visible and project an image of size and strength to the public. A second floor location would not satisfy these objectives, nor would it attract

customers from off the street. The main savings office should also be convenient for people in a hurry and for the elderly who are a major source of savings; in the view of the Association, an escalator ride would present a psychological barrier to these 2 groups of people. (Ernest J. Piccone, Corporate Services Manager, San Francisco Federal Savings and Loan Association, letter communication, 2 June 1979. This letter is available for public review at the Department of City Planning, Office of Environmental Review.)

C. INITIATIVE-CONFORMING ALTERNATIVE

A building could be designed for the site which would conform to the Initiative to Limit the Height and Floor Area Ratios of Buildings in Downtown San Francisco (Proposition O was defeated in the November 1979 election). Had the Initiative passed, it would have limited the height of structures in the C-3-O District to 260 ft. (about 20 stories) and the Basic Floor Area Ratio to 8:1, exclusive of bonuses for preservation of a designated landmark or the construction of housing on the site or nearby; with bonuses, the maximum Floor Area Ratio would be 14:1. Several possible building designs could be constructed on the site under the provisions of the Initiative. (Alternative designs are available for public review at the Department of City Planning, Office of Environmental Review.) One such design would consist of a 14-story, 185-ft. tall rectilinear tower containing 140,000 gross sq. ft., exclusive of any mechanical floors (see Figure 29). The facade of the building would be of a lightweight material and tinted glass, similar to the proposed project. The 100 ft. by 100 ft. square tower would be set back 37 ft. from the eastern property line and 27 ft. from the southern property line along Halleck St. The open areas formed by these setbacks would be landscaped with planters and used as pedestrian walkways and open space.

This alternative would contain about 130,000 gross sq. ft. of office space (about 120,000 net sq. ft.) and about 10,000 gross sq. ft. of Savings and Loan savings office and retail space on the first floor (about 8,000 net sq. ft.). The structure would be about 165 ft. shorter and have about 1/2 the floor area of the proposed project.



LEGEND

BUILDING ENTRANCES

185 FT. HEIGHT OF BUILDING

FIGURE 29: INITIATIVE-CONFORMING ALTERNATIVE WITHOUT HOUSING - SITE PLAN

SOURCE: ENVIRONMENTAL SCIENCE ASSOCIATES, INC.

The elimination of the landscaped setbacks at the corners of the structure would result in reduced visual interest. Pedestrian interest would be provided by the landscaped open areas and could be increased by the addition of shop windows along the walkways. The walkways would be shaded by existing buildings and the proposed tower most of the day at most times of the year. Shadows on the podium level of Two Embarcadero Center would be reduced.

The domestic water, sewer and solid waste disposal requirements of this alternative would be about 1/2 those of the proposed project. The alternative would generate about 45% fewer auto and transit trips, with a corresponding reduction in air pollution. As with the project, this alternative would result in the destruction of the 3 buildings on the site and would force the relocation of the 11 businesses located there.

Based on a fair market value of $15.8 million, 32% less than the proposed project, this alternative would have an assessed value of $4.0 million. The estimated total composite property tax revenues would be between $158,000 and $200,000. Property tax revenues to San Francisco would be between $134,000 and $170,000. This would be a net increase of $118,000 to $154,000 over composite property tax revenues to San Francisco from the existing buildings on the site.

The project sponsor has elected not to propose such a design because rental floor area would be reduced, and this would not be economically feasible given the size of the site. Elimination of the proposed pedestrian way between Battery and Sacramento Sts. is not considered desirable by the project sponsor, and the project sponsor does not consider a shorter building compatible with other major buildings in the area, such as One Embarcadero Center.

VARIANT INCORPORATING THE HOUSING BONUS

There were 2 density bonuses available under the Height Limit Initiative (Proposition O). One bonus was for the preservation of a designated landmark and the other was for provision of housing on or near the site. Since the structures on the site have not been officially designated as landmarks, that

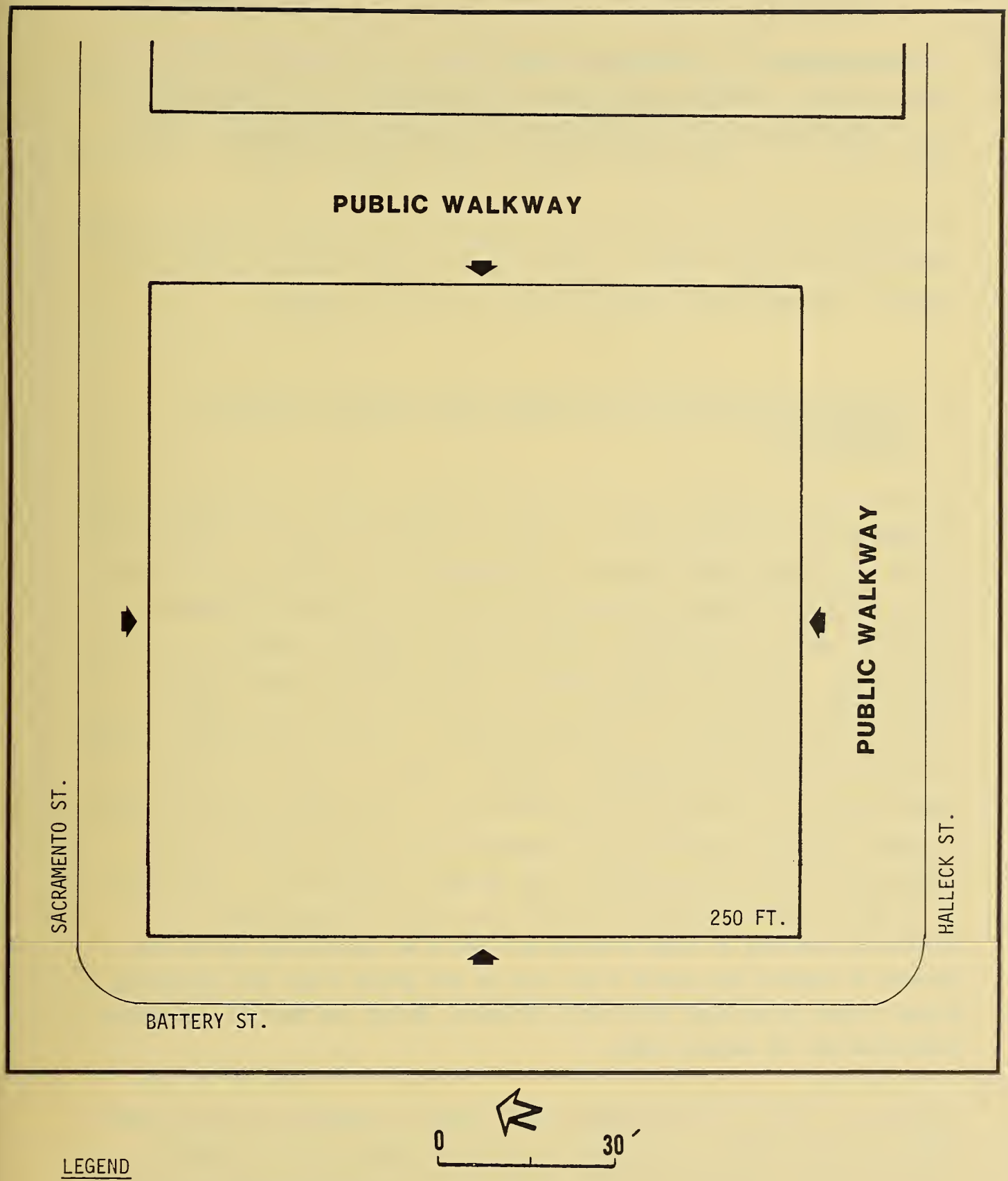
bonus would not have been available to the project sponsors. Additional office space could have been constructed, however, on a 1 for 1 basis in return for provision of housing, up to an overall Floor Area Ratio of 14 to 1. The maximum floor area for the site would thus be 245,400 gross sq. ft., including housing.

One such variant design containing housing would be about 250 ft. tall (100 ft. shorter than the project) and contain 20 stories. The facade would be similar to the proposed project (see Figure 30). The approximately 110 ft. by 110 ft. rectilinear tower would be set back 27 ft. from the eastern property line and 17 ft. from the southern property line. The landscaped open areas formed by the setback of the building would be used as walkways to provide pedestrian interest.

The variant design would have about 245,000 gross sq. ft. of floor area (about 15% less than the proposed project). The first floor would contain about 12,000 gross sq. ft. (9,500 net sq. ft.) of retail and commercial space. The 2nd through 15th floors and a portion of the 16th floor would be occupied by about 180,000 gross sq. ft. (163,000 net sq. ft.) of offices. The uppermost 5 floors would contain about 53,000 gross sq. ft. of residential space. About 50 condominium units, costing about $200,000 each, would be provided; these would probably be occupied by upper-income persons working in the Financial District and might also be leased by companies for use by out-of-town employees.

Such a building would require increased community services and energy to serve the residents. Provision of such housing close to the major employment center of the City might reduce peak-hour travel by residents to downtown jobs.

The estimated fair market value would be about $29.0 million, about 7% more than the proposed project, and the assessed value would be $7.3 million. This would produce between $289,000 and $366,000 in total composite property taxes. Composite property tax revenues to San Francisco would be between $246,000 and $311,000. The net increase in property tax revenues to San Francisco would be between $230,000 and $295,000.



LEGEND

BUILDING ENTRANCES

250 FT. HEIGHT OF BUILDING

FIGURE 30: INITIATIVE-CONFORMING ALTERNATIVE WITH HOUSING - SITE PLAN

SOURCE: ENVIRONMENTAL SCIENCE ASSOCIATES, INC.

The elimination of the landscaped corner setback would result in the decreased visual interest of the building facade. Shadowing of the Two Embarcadero Center podium level would be reduced; the on-site walkways would be shaded most of the year by existing buildings or the alternative tower.

The project sponsor has elected not to propose such a design including housing because housing would require a Conditional Use Authorization in the C-3-O District, and additional security precautions would be needed.

D. ALTERNATIVES MAINTAINING THE FACADES OF 280 BATTERY ST. AND 353 SACRAMENTO ST.

An alternative building design for the site would preserve the facades of 353 Sacramento St. and 280 Battery St. which are rated "O" and "1", respectively, in the 1976 Architectural Inventory (Department of City Planning) and rated "B" in the 1979 Heritage architectural and historic resources inventory. 240-248 Battery St., rated "D" in the Heritage inventory, would be demolished. A high-rise office tower of approximately the same floor area as the proposed project would then be built above the 2 retained building facades. 353 Sacramento St. and 280 Battery St. are brick buildings. They do not have the structural strength to support a high-rise tower so all the support would be provided by new construction. The facades would have to be isolated from the interiors of the structures during demolition and site preparation, braced, and protected from damage from machinery. Preservation of the brick facades would be difficult, but could be accomplished. A structural concrete or steel bracing wall would be constructed behind the facades to support the usable floor area on the ground floor and succeeding higher floors (Alan Rudy, Architect, Skidmore, Owings and Merrill, telephone communication, 16 January 1980).

Retention of the 2 building facades would preserve a measure of the existing pedestrian environment. Incorporation of the 2 facades into a coherent building design would be difficult, however, because they are not of the same height nor architectural style (see Figure 11, p 18). The impacts of this alternative would otherwise be similar to the project as proposed.

The project sponsor has rejected this alternative because of the ground floor area which would be lost in preserving the brick facades, the restrictions it would impose on architectural design, and the elimination of the pedestrian way providing a connection between Battery and Sacramento Sts.

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X. APPENDICES

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APPENDIX A: INVENTORY OF ARCHITECTURALLY SIGNIFICANT BUILDINGS

In 1974, 1975 and 1976, the San Francisco Department of City Planning conducted a parcel by parcel, citywide inventory of architecturally significant buildings. An advisory review committee of architects and architectural historians, including John Beach, Architectural Historian; Michael Corbett, Architectural Historian; John Frisbee, Regional Driector, National Trust for Historic Preservation; Mrs. G. Bland Platt, President, San Francisco Landmarks Preservation Advisory Board; James Ream, Architect; Judy Waldhorn, Architectural Historian; Francis Whisler, Architect: Sally Woodbridge, Architectural Historian; William Coburn, Architect; Robert Hersey, Architect; and Al Lanier, Architect; assisted in the final determination of evaluative ratings for the 10,000 buildings which have been entered in an unpublished 60-volume record of the inventory. The buildings have been recorded on color-coded maps which identify locations and relative significance; these are available for public inspection at the Department of City Planning.

The inventory was not an inventory of historic structures. Rather, it was an inventory of buildings that were considered to be architecturally significant from the standpoint of overall design, or particular design features. Contemporary buildings were included as well as some more than 50 years old. Each building was numerically rated as to its overall architectural significance. The ratings ranged from a low of "0" to a high of "5". The buildings were also separately classified by style. Finally, each structure received a summary rating based on the first 2 codes as well as on its environmental and urban design setting, which also ranged from "0" to "5". Thus each building included in the inventory was coded by its architectural significance, its style, and its overall environmental significance. Buildings receiving a summary rating of "3" or higher are considered to be structures of merit.

Inclusion of a building in the inventory does not necessarily require or encourage its preservation. Rather, the urban design purpose is to guide the design of new construction which would affect the setting or visual environment of such buildings so as to minimize the harmful or incompatible effects.

APPENDIX B: ARCHITECTURAL AND HISTORICAL SURVEY BY THE FOUNDATION FOR SAN FRANCISCO'S ARCHITECTURAL HERITAGE

The Foundation for San Francisco's Architectural Heritage, through its consultants Charles Hall Page & Associates, has completed and published a recent architectural and historical survey of all downtown buildings (Splendid Survivors, San Francisco Architectural Heritage, 1979). Most buildings surveyed were scored according to four categories or criteria: Architectural Significance; Historical-Cultural Signficance; Environmental Significance and Negative Alterations. Summary ratings from A to D were then assigned to each building built before 1945 on the basis of these scores.

The ratings are defined as follows:

A A particularly fine, early, rare, or environmentally irreplaceable type of resource. San Francisco's best. Eligible for the National Register of Historic Places, State Inventory, and probably City Landmark status. Particularly strong individual landmark importance.

B An important landmark of National Register Quality. A very good or conspicuous resource type or of signifcant environmental influence. Eligible for the State Inventory and possibly City Landmark status.

C Resources which have some merit and strength of identity. These may be considered background buildings. They are important elements of the urban fabric which support the character and setting of more significant resources. Eligible for the National Register or State Inventory when included in historic districts.

D Buildings of no particular cultural or design merit, with little historical significance.

APPENDIX C: MICROCLIMATE STUDY

I. INTRODUCTION

Architects, engineers and city planners designing urban structures are limited by the lack of information on wind effects brought on by the presence of structures, such as discomfort for pedestrians and wind-caused mechanical problems with doors, windows and ventilating systems. Once a structure is built, remedial measures (if they exist at all) are usually very expensive.

It is difficult to anticipate, by analysis or intuition, the winds that will be caused by a structure, since they are determined by very complex interactions of forces. Fortunately, it is possible to predict the wind patterns and pressures around structures by testing scale models in a wind tunnel that can simulate natural winds near the ground. This allows the designer to foresee possible environmental and mechanical problems and alleviate them before the building is erected.

Data from wind tunnel tests can be combined with climatological data to analyze the effects of a proposed structure on pedestrians in terms of human comfort. The frequency distribution of wind strengths at pedestrian level, combined with temperature data and shadow patterns of the proposed structure and its surroundings, can be used to forecast comfort at pedestrian levels.

II. SUMMARY

A wind tunnel investigation was conducted on models of the site as it now exists, and as it would exist with the proposed project and 1 alternative. The project and alternative designs varied in shape, site coverage and height.

The proposed building of 350 feet with setbacks at different heights was found to increase northwesterly winds from moderately high to high near the Halleck-Battery and California-Battery intersections. Wind would decrease along Halleck St. and near the Front-Sacramento Sts. intersection. The building caused an increase of westerly winds from low to moderate levels at the Sacramento-Battery intersection and the north side of the Halleck-Battery intersection. Westerly winds also would be accelerated along Halleck and Sacramento Sts.

A 395-foot conventional rectangular building was found to have a similar, but greater, effect on winds for both wind directions tested. One exception was west winds along Sacramento St. east of the site, where this alternative increased winds less than the proposed project.

III. BUILDING AND SITE DESCRIPTION

The proposed project site is in downtown San Francisco, at the southeast corner of Sacramento and Battery Sts., north of Halleck St. The site currently is occupied by 3 buildings, ranging from 2 to 6 stories. The area surrounding the site is comprised of a mixture of older and newer highrise office buildings. The One Embarcadero Center highrise complex is located directly across Sacramento St. from the site.

The proposed project is 127 ft. wide by 137 ft. deep, with a height of 350 ft. The building would have 3 setbacks. A rectangular setback would be placed at about 30 ft. on the second floor along Sacramento St. The sixth floor would have a triangular setback of about 80 ft. at the corner of Battery and Sacramento Sts. between the entranceways, and the 14th floor (about 185 ft.) would have a triangular setback at the corner of Halleck and Battery Sts (see Figure C-2).

For this report, Alternative I would be a rectangular building 125 ft. wide by 102 ft. deep, with a height of 395 ft. This alternative would have not setbacks from surrounding streets. The building would not cover the entire site, but would have a 35-ft. wide open space between structures, running from Sacramento St. to Halleck St. (see Figure C-3).

IV. MODEL AND WIND TUNNEL FACILITIES

Model

Scale models of the proposed building phases and alternatives and nearby structures were constructed of polystyrene and urethane foams. A model of the structures surrounding the area for a distance of several blocks was constructed of the same materials.

The scale used was 1 inch equals 30 ft. The model of the surrounding city area was built to this scale with building configuratons and heights obtained from the Sanborn maps at the San Francisco Department of City Planning.

Wind Tunnel Facilities

The Environmental Impact Planning Corporation boundary layer wind tunnel was designed specifically for testing architectural models. The working section is 7 ft. wide, 43 ft. long, and 5 ft. high. Wind velocities in the tunnel can be varied from 3.5 mph to 13 mph. The flow characteristics around sharp-edged objects such as architectural models are constant over the entire speed range. Low speeds are used for photographing tracer smoke, high speeds for windspeed measurements.

Simulation of the characteristics of the natural wind is facilitated by an arrangement of turbulence generators and roughness upwind of the test section. These allow adjustments in wind characteristics to provide for different scale models and varying terrain upwind of the project site.

Measurements of windspeed around the model are made with a hot-wire anemometer, a device that relates the cooling effect of the wind on a heated wire to the actual windspeed. The flow above the city is measured by a Pitot tube connected to a micromanometer. The Pitot tube and micromanometer measure directly the pressure difference between moving and still air. This pressure difference is then related to the actual windspeed. Flow visualization is achieved by use of floodlit smoke in conjunction with a 35-mm camera.

V. TESTING METHODOLOGY

Simulation of Flow

The most important factors in assuring similarity between flow around a model in a wind tunnel and flow around the actual building are the structure of the approach flow and the geometric similarity between the model and the prototype. A theorectical discussion of the exact criteria for similarity is not included in this paper, but may be found elsewhere (Cermak, 1966, or Cermak and Arya, 1970).

The variation of windspeed with height (wind profile) was adjusted for the scale of the model and the type of terrain upwind of the site. The profiles used were those generally accepted as adequately describing the flow over that type of terrain (Lloyd, 1967).

Testing Procedure

The windflow characteristics of the site in its present state were investigated to ascertain the present wind environment. Windspeeds and wind directions at specified points throughout the site were measured and recorded. Wind direction was measured by releasing smoke at each point and recording the direction in which the smoke traveled. Windspeed measurements were made at the same points, at a scale height of 5 ft. above the ground. A hot-wire anemometer probe is required to make these measurements within a fraction of an inch of the model surfaces. The probe is repeatedly calibrated against the absolute reading of a Pitot tube and micromanometer. Velocity readings close to the model are generally accurate to within 10% of the true velocity.

Measurements for building phases and alternatives are made by keeping the probe in place while replacing the existing buildings with each proposal under consideraton.

Before and after each test run, a calibration measurement was made above the model. The purpose of these measurements was to relate the wind tunnel measurements to actual wind records from U.S. Weather Service wind instrumentation located on the Federal Building at 50 Fulton St., and to provide a method for comparing results to those of previous tests on other projects.

VI. TEST RESULTS AND DISCUSSION

Tests of windspeed and wind direction were conducted for 2 wind directions.

Measured windspeeds are expressed as percentages of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station. Thus a plotted value of 52 means that the measured windspeed is expected to be 52% of the windspeed recorded by the Weather Service when winds are from that particular direction.

The plotted values can be interpreted in terms of general "windiness" using the scale below. This scale is subjective and is based on information gathered from similar studies in San Francisco.

Velocity Ratio	Ratio of Pedestrian Level Windspeed to Calibration Windspeed
Low	- 0.19
Moderately low	0.20 - 0.29
Moderate	0.30 - 0.49
Moderately high	0.50 - 0.69
High	0.70 - 1.00
Very high	Greater than 1.00

It should be noted that the plotted values are not actual wind speeds, but ratios. Thus a point having a "very high" windspeed ratio would still experience light winds on a near-calm day. Likewise, a point found to have a "low" windspeed ratio could experience significant winds on an extremely windy day.

Wind direction is indicated by an arrow pointing in the direction of flow. Where wind direction fluctuated, 2 arrows representing the principal flow directions were plotted. Areas of fluctuating winds are normally turbulent, as are areas of spiraling motion; the latter are denoted by curved arrows.

Northwest Wind

Northwest winds occur 12% to 39% of the time in San Francisco, depending on the season. (In meteorology, a northwest wind blows from the northwest.) Northwesterly and westerly winds are the most frequent and the strongest winds at all seasons in San Francisco. Northwest winds exceed 13 mph 35% of the time and 25 mph 3% of the time in summer. Wind frequencies and speeds are lower in spring, fall and winter.

Existing conditions under northwest winds are shown in Figure C-1. Generally, the area has moderately high to high wind speed ratios, particularly at the Battery-Sacramento and Front-Sacramento intersectios. Wind flows generally are along the north-south streets, with strength diminishing to the south. On the east-west streets, winds generally are turbulent, with speed ratios varying from moderate to moderately high. The podium level of the Embarcadero Center has high to very high wind speed ratios.

The construction of the proposed project would not affect basic air flow patterns except along Sacramento St., where the building would strengthen the east-west flow of air (see Figure C-2). The wind strength ratio would increase near the Halleck-Battery and California-Battery intersections, and east of the site along Sacramento St. Wind speed ratio decreases would occur along Halleck St. and Sacramento St. at the site. Wind speed ratios at the podium level of the Embarcadero would not change. Wind speed ratios at the bases of the 2 setbacks on Battery St. would be high, primarily due to the heights of the setbacks. The rear setback area would be sheltered from the wind.

The effects of Alternative 1 would be similar to those of the proposed project, although wind speed ratios would be greater (see Figure C-3) on Sacramento St. at the site and further to the east.

West Wind

West winds occur between 15% and 40% of the time, depending on the season. They exceed 13 mph 29% of the time and 25 mph 7% of the time in summer. Wind strengths and frequencies are somewhat lower in spring, fall and winter.

Site conditions under westerly winds are shown in Figure C-4. Because the site is sheltered by upwind buildings from this direction, winds are light, with ratios ranging from low to moderately low.

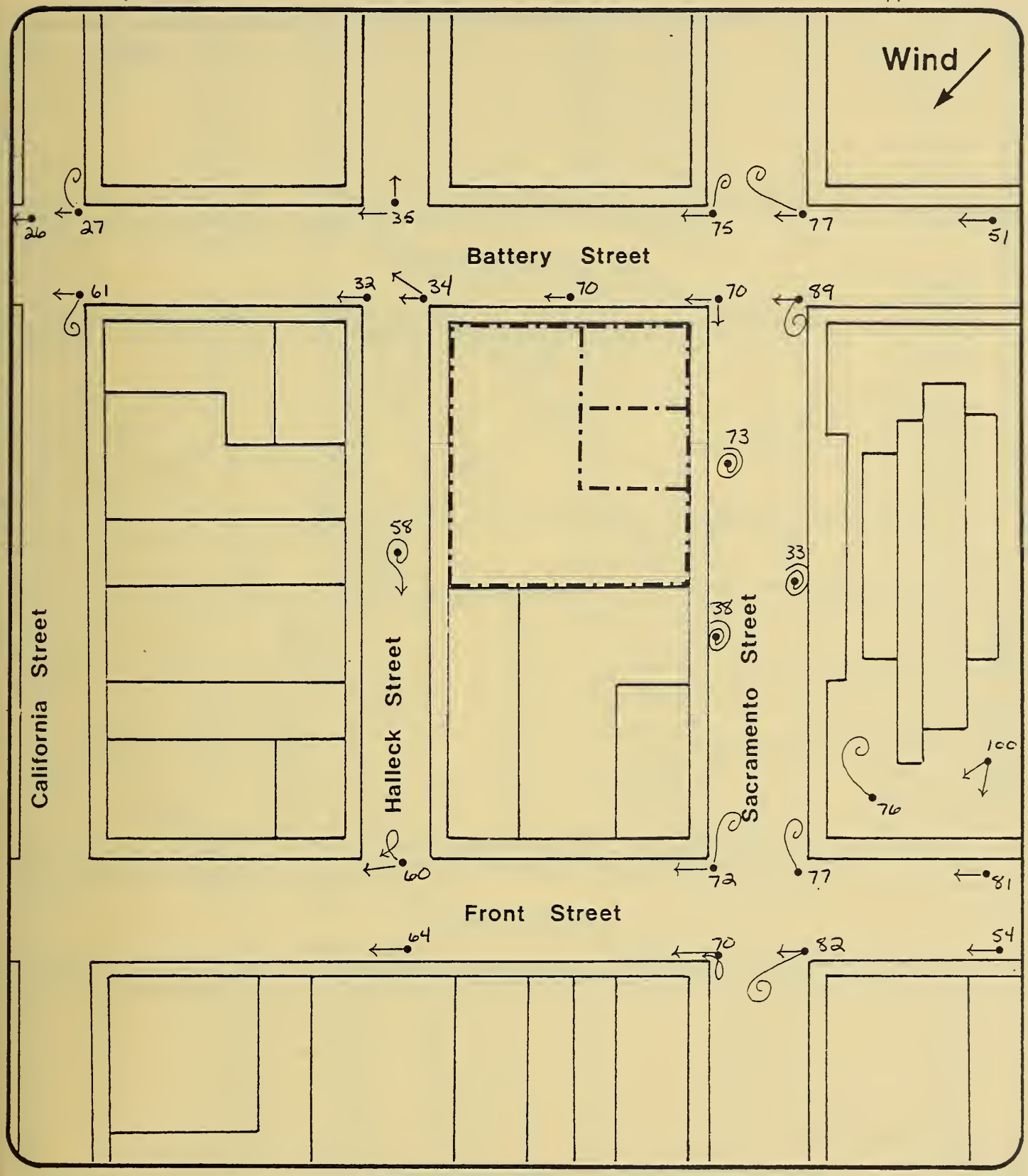
The proposed project would cause changes in the air flow patterns near the site (Figure C-5). The northerly flow along Battery St. would be reversed south of the site, and enhanced north of the site by the wind intercepted by the proposed building. Wind speed ratios at the Battery-Sacramento intersection would increase from moderately low to moderate, as would wind speed ratios on the west side of the Halleck-Battery intersection. Wind speed ratios along both Halleck and Sacramento Sts. would be accelerated from low and moderately low to moderate speeds.

Alternative 1 would have a similar effect along Battery Street, although the wind speed ratios increases would be greater. This probably is due to the less irregular shape of the western elevation of the building, which makes it less streamlined and more of an obstacle to the wind. With this alternative there would be a greater increase in wind speed ratio along Halleck St. than with the proposed project, but there would ba a smaller increase along Sacramento east of the site. This is apparently due to the passageway between Halleck and Sacramento.

VII. MITIGATION MEASURES

An effective mitigation measure would involve additions to the project that would provide local shelter for pedestrians. Small structures, such as kiosks for newspaper or flower vendors, telephone booths and shelters at bus stops, can serve in this way. Similarly, street trees and other vegetation can function as windbreaks. These measures would be appropriate along Sacramento and Battery Streets.

The upper-level, outdoor spaces formed by the building setbacks (at 78 and 189 ft. heights) have high wind speed ratios, and would not appear to be usable as outdoor space without wind protection. Glass walls, vegetation and screening would provide protection, although enclosure of the areas might be necessary to ensure comfortable conditions.



Existing Site Wind-Northwest

LEGEND

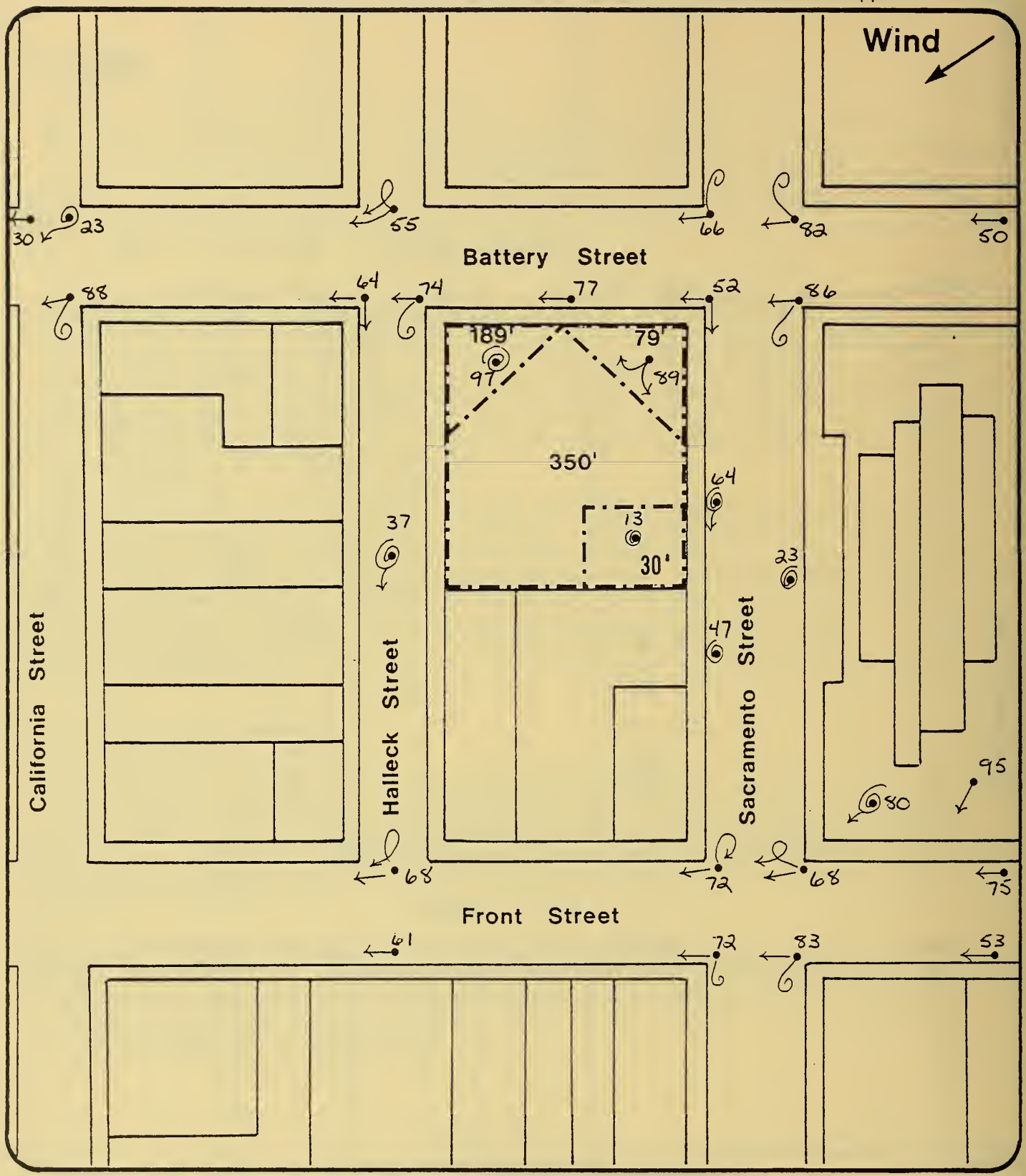
58 Wind speed ratio at monitoring location

Wind direction at monitoring location

North

Not to Scale

Figure No. C-1



Proposed Project
Wind-Northwest

LEGEND

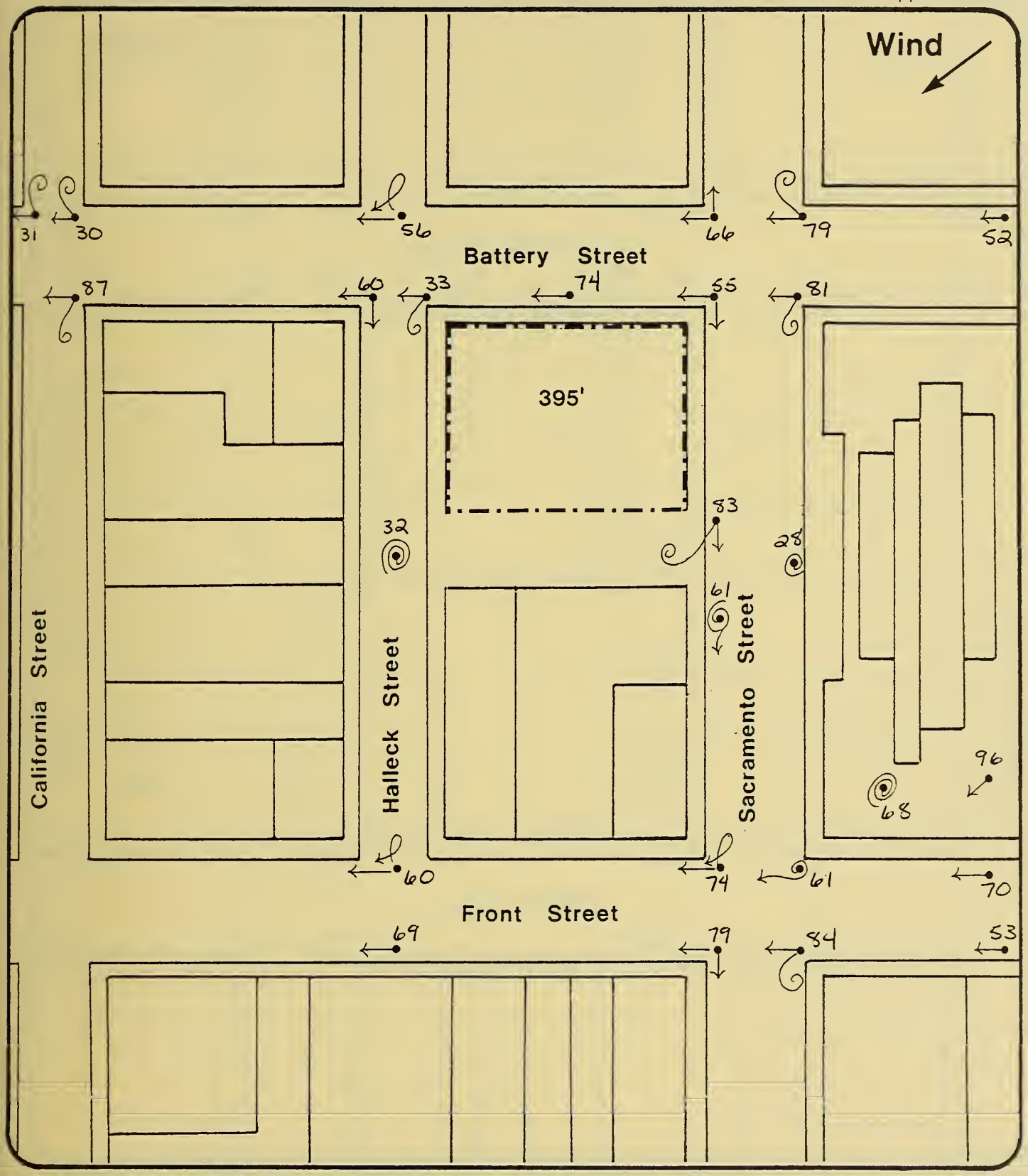
58 Wind speed ratio at monitoring location

Wind direction at monitoring location

North

Not to Scale

Figure No. C-2



Alternative 1
Wind-Northwest

LEGEND

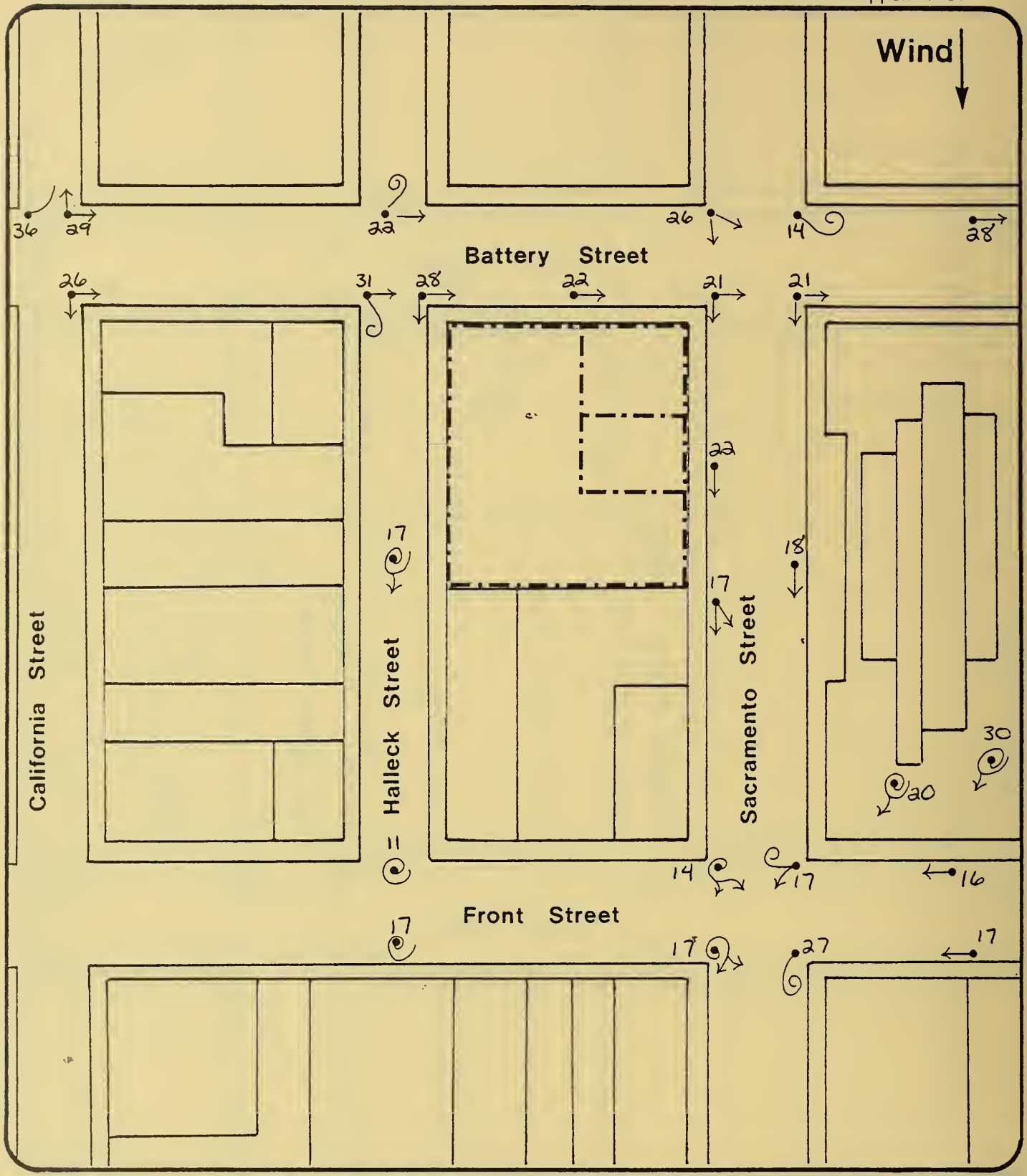
58 Wind speed ratio at monitoring location

Wind direction at monitoring location

North

Not to Scale

Figure No. C-3



Existing Site Wind-West

LEGEND

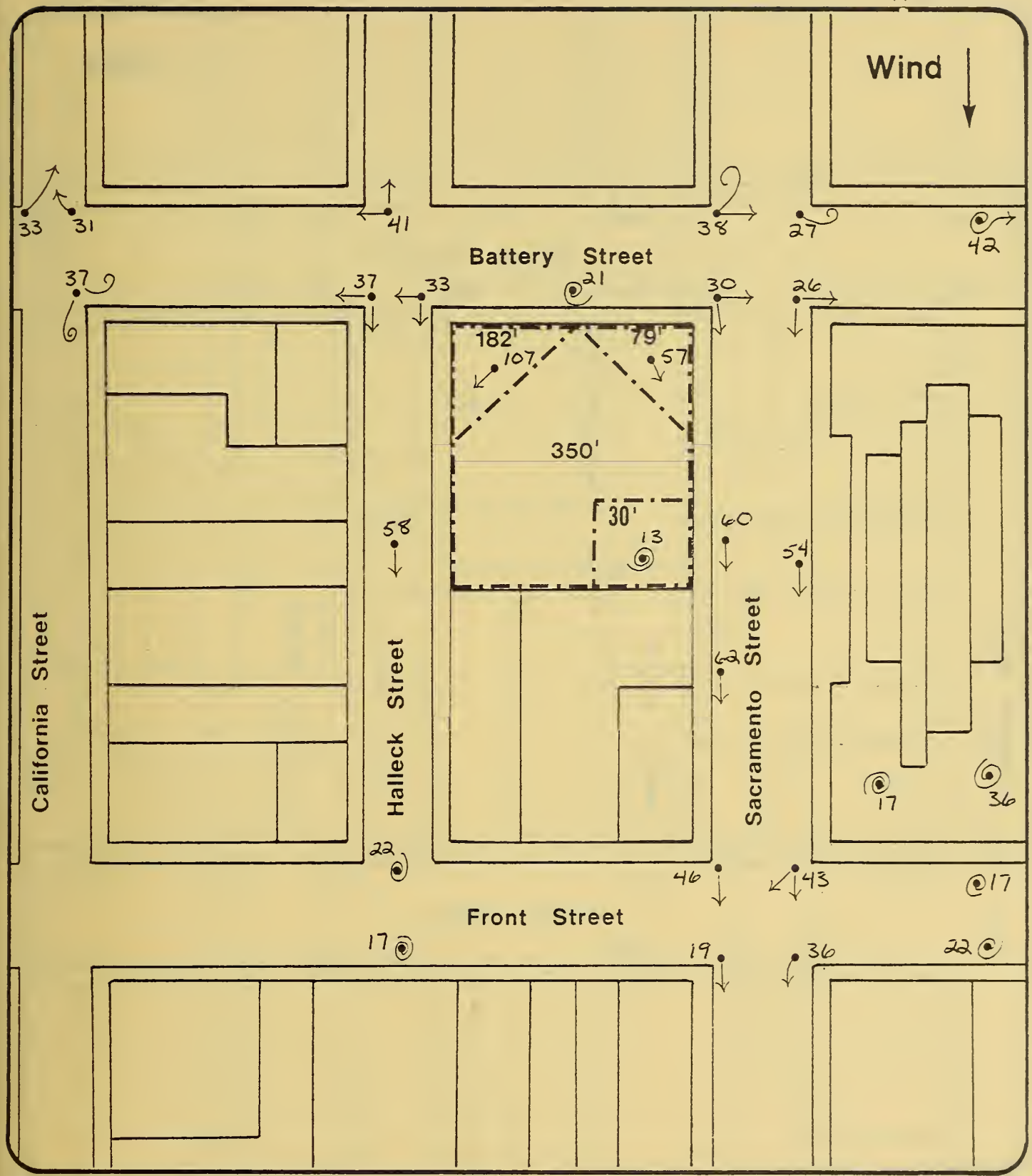
58 Wind speed ratio at monitoring location

Wind direction at monitoring location

North

Not to Scale

Figure No. C-4



Proposed Project
Wind-West

LEGEND

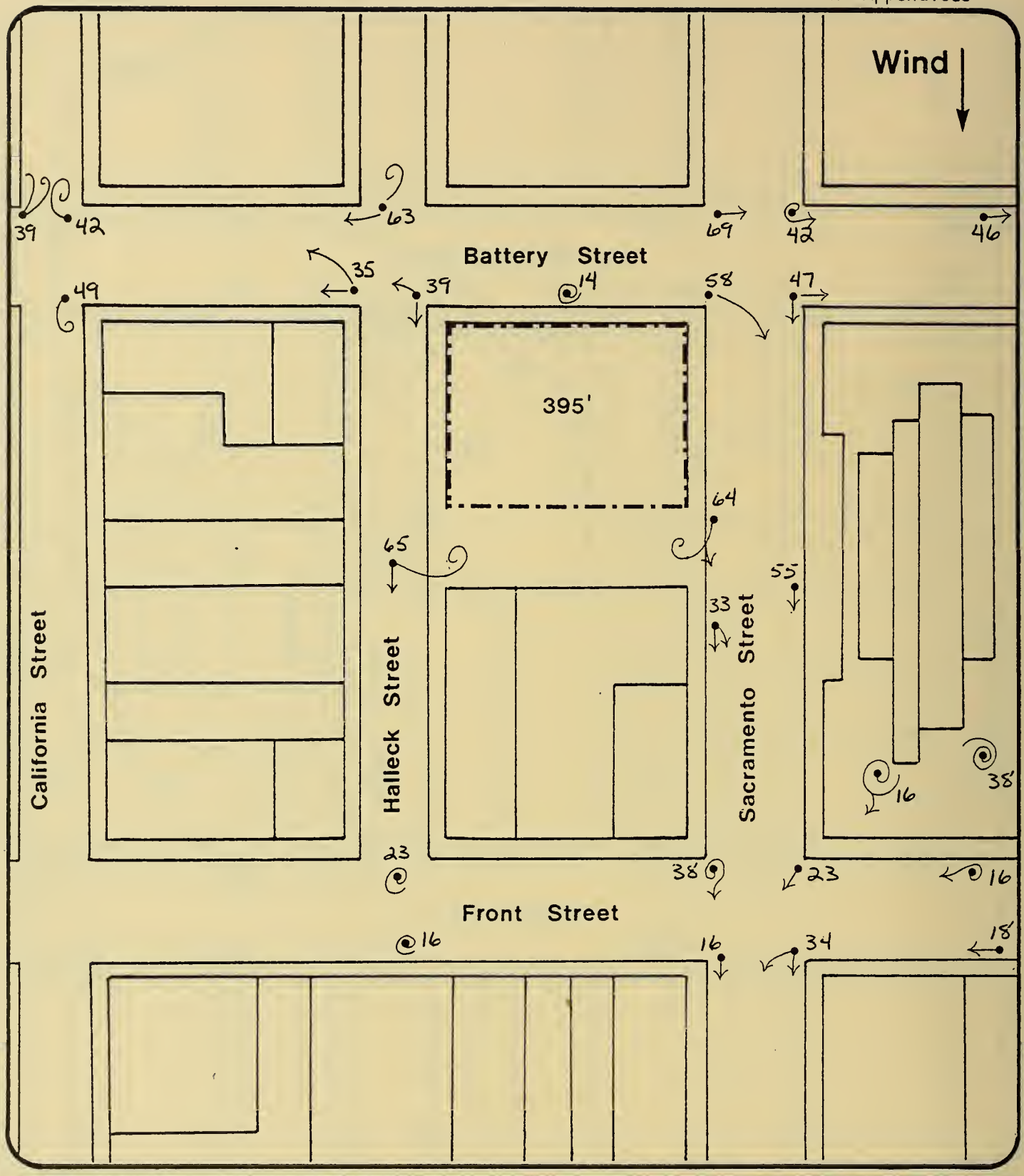
58 Wind speed ratio at monitoring location

Wind direction at monitoring location

North

Not to Scale

Figure No. C-5



Alternative 1
Wind-West

LEGEND

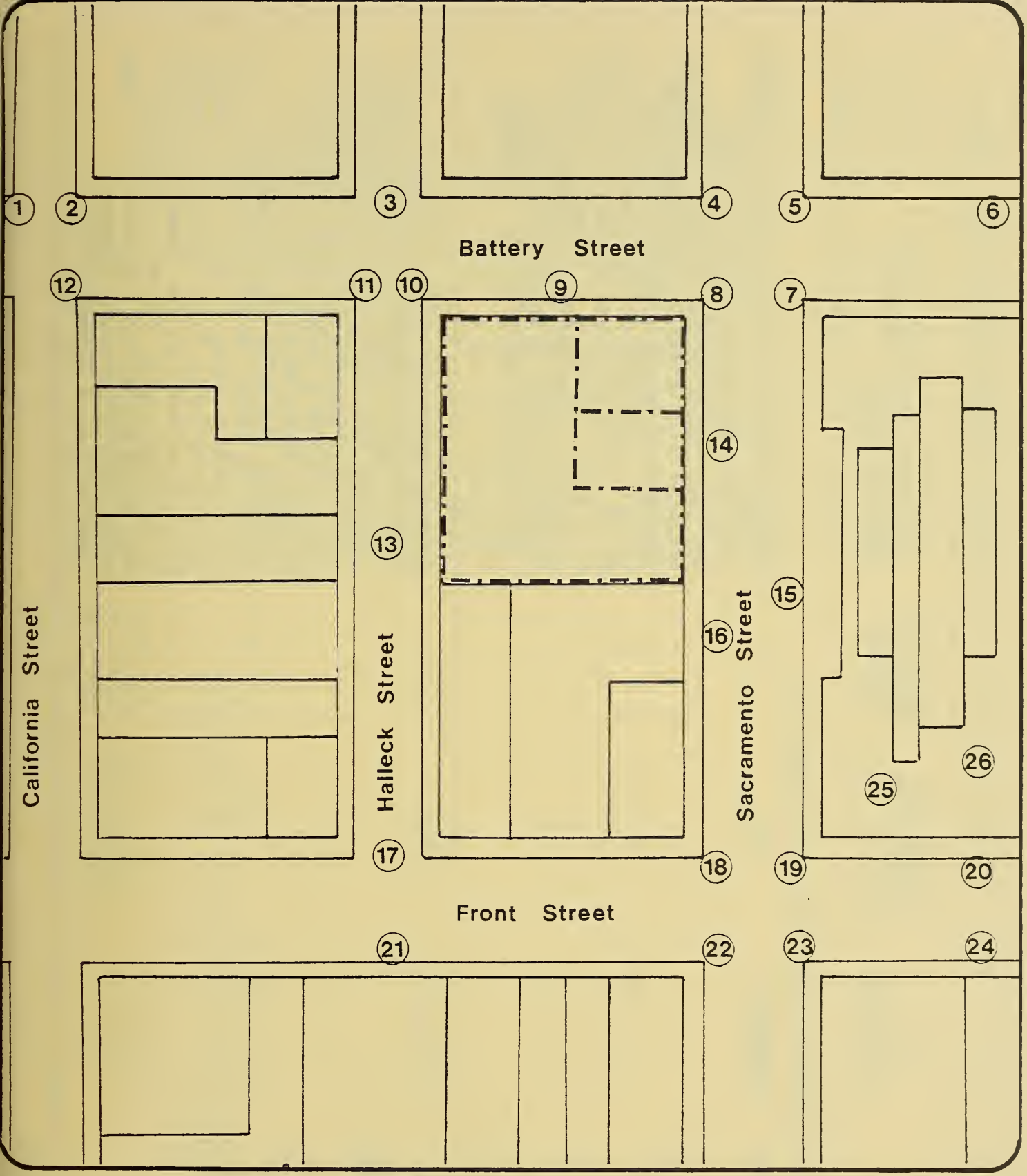
58 Wind speed ratio at monitoring location

Wind direction at monitoring location

North

Not to Scale

Figure No. C-6



Monitoring Stations

North

Not to Scale

Figure No. C-7

TABLE D-1: BLOCK 237, LOTS 14, 15 and 16: TENANTS BY BUILDING, EXISTING USES, EMPLOYMENT AND RELOCATION STATUS

Floor	Tenant	Type of Business Use	Approximate Occupied Area (total sq. ft.)	Approximate Number of Employees	Current Relocation Status and Impacts on Tenants
240-248 Battery St. Building (includes 335-337 Sacramento St.)					
1st	Gourmet Plate	Restaurant	2,731	9	One-year demolition clause in lease. According to tenant, it would be difficult to find a suitable location replacement within the 1-year notification period. Tenant is interested in space in new building, but expense may be too great. Moving to a temporary location during building construction would be difficult because a large amount of equipment would have to be moved. According to tenant, it might be necessary to close business, resulting in financial loss (S. Chinn, Owner, The Gourmet Plate, telephone communication, 11 November 1979).
1st	Stone Soup (owned by Souper Soupe Corporation)	Restaurant	4,220	15	Six-month demolition clause in lease. Restaurant would probably go out of business. There is a small chance that the restaurant might move to a new location in same general area. Then, according to tenant, there would probably not be a large loss of clientele. Financial losses would be great if the restaurant were moved, due to extensive remodelling costs. Were Stone Soup to move to the proposed building, it would require rental space on the ground floor; the business would close during construction. However, according to the tenant, Stone Soup would probably not move to the new building (R. Delmon, President, Souper Soupe Corporation, telephone communication, 19 November 1979).

Table D-1, Continued

Floor	Tenant	Type of Business Use	Approximate Occupied Area (total sq. ft.)	Approximate Number of Employees	Current Relocation Status and Impacts on Tenants
240-248 Battery St. Building (includes 335-337 Sacramento St.)					
1st	Vaughn-at-Sather Gate, Inc.	Men's Clothing	3,000	8	Six-month demolition clause in lease. According to the tenant, it would be difficult for them to relocate within the demolition notification period. Their clientele requires a Financial District location; they prefer a location near to their current one. Financial losses anticipated by the tenant include moving and decorating costs, as well as a loss in gross sales in the range of $100,000 to $200,000 due to a less advantageous location. Tenant would be interested in space in the new building if rental costs were not too high (R. Glass, Controller, Vaughn-at-Sather Gate, Inc., telephone communication, 13 November 1979).
2nd	M. Arthur Gensler, Jr. and Associates, Inc.	Architecture	11,740	185	One-year termination clause in lease. According to tenant, it would be difficult to relocate. Relocation would involve moving the firm's offices from 3 buildings that would be demolished as a result of the proposed project (28,000 sq. ft. of floor space) as well as from the nearby 550 Kearny St. Building (8000 sq. ft. of floor space) as the firm's offices must be in the same vicinity. Tenant would have to find space within the Financial District. Tenant would not rent offices in proposed building because that would involve moving twice. According to the tenant, rental costs at a new location would be higher (A. Gensler, M. Arthur Gensler, Jr. and Associates, Inc., telephone communication, 14 November 1979).
Base-ment	"	Storage of Records	3,000		

Taole D-1, Continued

Floor	Tenant	Type of Business Use	Approximate Occupied Area (total sq. ft.)	Approximate Number of Employees	Current Relocation Status and Impacts on Tenants
240-248 Battery St. Building					
1st	Snappy Foto (owned by Perfection Processors, Inc.)	Photography Store	250	2	Space subleased from M. Arthur Gensler, Jr. and Associates, Inc. Tenant would try to relocate, but anticipates difficulty in relocating; has been searching for another location in the same vicinity for 12 months. Tenant needs location with many pedestrians; would consider space in proposed building (G. Haag, Owner, Perfection Processors, Inc., telephone communications, 25 November 1979).
1st	M. Arthur Gensler, Jr. and Associates, Inc.	Architecture	1,000		Under 240 Battery St. Building
2nd	"	"	1,500		"
353 Sacramento St. Building					
1st	"	"	3,220		"
2nd	"	"	1,560		"
3rd	Hodge & Clark	Law Firm	2,400	12	One-year demolition clause in lease. According to tenant, it would be difficult to relocate. A move would probably increase overhead costs by approximately 25% due to an increase in rental costs. Tenant would not rent in proposed building because this would involve moving to a temporary location (J. Hodge, Principal, Hodge and Clark, telephone communication, 14 November 1979).

Table D-1, Continued

Floor	Tenant	Type of Business Use	Approximate Occupied Area (total sq. ft.)	Approximate Number of Employees	Current Relocation Status and Impacts on Tenants
353 Sacramento St. Building					
4th	Mike McCormac Realtors Embarcadero Mortgage Corporation Pichey Associates (office space shared by the above 3 firms)	Real Estate	1,500	10 (all three firms)	One-year demolition clause in lease. Tenants feel that they would be able to find appropriate new space within the notification period. Tenants would consider moving into proposed building; this would involve moving to a temporary location during construction (M. McCormac, Embarcadero Mortgage Corporation and Mike McCormac Realtors, telephone communication, 13 November 1979; E. Spinney, Office Manager, Pichey Associates, telephone communication, 16 November 1979).
5th	Helen Culiner, Attorney	Law Office	1,500	5	One-year demolition clause in lease. Tenant would definitely relocate. According to tenant, it would be difficult to relocate in the vicinity within the lease's notification period. Unlikely that this tenant would move into proposed building (H. Culiner, telephone communication, 13 November 1979).
6th	William J. Healey & Associates	Advertising Space Sales	1,500	6	One-year demolition clause in lease. According to tenant, it would be difficult for them to find other space in San Francisco. Rents in proposed building are expected to be too high. Most business is in the Santa Clara - San Jose area, so might move to that area (W. Healey, telephone communications, 20 November 1979).
Base-ment	Helen Culiner, Attorney	Law Firm Storage Space	215		

Table D-1, Continued

Floor	Tenant	Type of Business Use	Approximate Occupied Area (total sq. ft.)	Approximate Number of Employees	Current Relocation Status and Impacts on Tenants
353 Sacramento St. Building, cont.					
Base-ment	Carroon and Black/Miller and Ames	Insurance Brokerage Storage Space	720	Not Applicable, Storage Space Only	Probably would switch to storing files in an archival system,* this could result in labor savings. According to tenant, it would be difficult to find storage space similar to what they have now. Space in proposed building would be too expensive for this use (M. Hilton, Vice President, Carroon and Black/Miller and Ames, telephone communication, 13 November 1979; L. Ginsberg, Personnel Manager, telephone communication, 14 November 1979).

*A storage system where contracting storage company retrieves and brings over desired files.

Sources: Tenants as noted; B. Azarin, Assistant Project Manager, Daon Southwest, telephone communications, October and November 1979, and letter communication 24 October 1979; M. Jayred, President, M and T Properties, telephone communications, November 1979 and letter communication, 15 November 1979.

APPENDIX E: ECONOMIC AND FISCAL ASPECTS

TABLE E-1: DISTRIBUTION OF 1979-80 PROPERTY TAXES LEVIED ON BLOCK 237, LOTS 14, 15 AND 16

	1979-80 Tax Rate (dollars per $100 assessed value)	Revenues (to nearest $100)	Percent
City and County of San Francisco	4.219	16,300	85
San Francisco Unified School District	0.344	1,300	7
San Francisco Community College District	0.058	200	1
Bay Area Air Quality Management District	0.008	**	**
BART	0.341	1,300	7
TOTAL	4.970	19,100	100

*Based on total 1979-80 assessed valuation of $385,635 for 3 parcels.
**Revenues less than $50.00 ($31.00) and tax rate less than 1% (0.016%) of the total tax rate.

SOURCE: Tax Collector, City and County of San Francisco, 1979-1980 Important Tax Information, 1979.

TABLE E-2: POST-WAR OFFICE GROWTH IN DOWNTOWN SAN FRANCISCO*

Completed	Period Years	Number	Total Gross Square Feet (millions)	Building Average Square Feet (thousands)	Range Square Feet (thousands)	Annual Average Rate Square Feet (thousands)	Range # of Stories
1945-1949	5	3	0.5	178	100 to 250	100	11 - 14
1950-1959	10	10	2.4	240	138 to 430	240	7 - 25
1960-1969	10	22	10.3	468	119 to 1,771	1,030	10 - 52
1970-1979	10	23	15.2	661	100 to 1,375	1,520	11 - 48
1980**	1	4	1.0	250	144 to 728	--	15 - 31
Subtotal Built	--	62	29.4	--	--	--	--
Under Construction***							
1979-1983	5	8	6.0	750	220 to 1,306	1,200	12 - 48
Proposed+							
1981-1982	2	2	0.5	250	223 to 259	250	18 - 24
To Be Proposed (Under EIR Review)++							
1981	1	2	1.1	550	318 to 775	--	24 - 42
Subtotal Pending	--	12	7.6	--	--	--	--
TOTAL		74	37.0				

*The Table is based on a telephone communication with C. Gill, Major Project Review, Department of City Planning, 30 November 1978 and on lists compiled by the San Francisco Department of City Planning which are available for public review at the Department of City Planning, Office of Environmental Review.
**Buildings scheduled for completion by the end of 1980 include 505 Sansome St., 601 Montgomery St., Hibernia Bank (California and Front Sts.), and 180 Montgomery St.
***Under Construction: 444 Market St, Four Embarcadero Center, 775 Market St., Federal Reserve Bank, Pacific Gateway, Crocker National Bank Headquarters, 101 California St., and Market and Main Sts.
+Proposed: 456 Montgomery St. and 150 Spear St.
++Under EIR Review: Daon Building and One Sansome St. An addendum list is on file at the Office of Environmental Review, titled "Major Office Buildings Proposed and To Be Proposed, First Quarter 1980."

APPENDIX F: TRAFFIC, TRANSIT AND PARKING

METHODOLOGY USED IN TRAFFIC ANALYSIS

The traffic volume data shown in Table 4, p. 35, are derived from historical data for 1976 and 1977 obtained from the San Francisco Department of Public Works, Bureau of Traffic Engineering, and from machine traffic counts made by TJKM, transportation consultants, on various weekday dates in 1978. Estimates of some 1978 traffic volumes were made by TJKM based on manual intersection count data made by TJKM on 25, 27, and 28 September 1978, and on the historical data for 1976 and 1977.

The capacity analysis of each intersection at which a turning movement count was made utilized the "critical lane" method. This method of capacity calculation is a summation of maximum conflicting approach lane volumes that gives the capacity of an intersection in vehicles per hour per lane. (This method is explained in detail in an article entitled "Intersection Capacity Measurement Through Critical Movement Summations: a Planning Tool", by McInerney, Henry B. and Stephen G. Peterson, January 1971, Traffic Engineering.) A sample calculation is included in the supporting documentation available for public review at the Department of City Planning, Office of Environmental Review.

The maximum service volume for Level of Service E was assumed as a benchmark. A service volume is the maximum number of vehicles that can pass an intersection during a specified time period in which operating conditions are maintained corresponding to the selected and specified level of service. For each intersection analyzed, the existing peak-hour volume was computed and a volume-to-capacity (v/c) ratio was calculated by dividing the existing volume by the capacity at Level of Service E.

TABLE F-1: TRAFFIC LEVELS OF SERVICE

Level of Service	Description	Volume/Capacity v/c Ratio
A	Level of Service A describes a condition of free flow, with low volumes and high speeds. Traffic density is low with speeds controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to the presence of other vehicles, and drivers can maintain their desired speeds with little or no delay.	0.60
B	Level of Service B is in the zone of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation. Reductions in speed are not unreasonable, with a low probability of traffic flow being restricted. The lower limit (lowest speed, highest volume) of this level of service has been associated with service volumes used in the design of rural highways.	0.61-0.70
C	Level of Service C is still in the zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is still obtained, with service volumes perhaps suitable for urban design practice.	0.71-0.80
D	Level of Service D approaches unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time.	0.81-0.90
E	Level of Service E cannot be described by speed alone, but represents operations at even lower operating speeds than in level D, with volumes at or near the capacity of the highway. Flow is unstable, and there may be stoppages of momentary duration.	0.90-1.00
F	Level of Service F describes forced flow operation at low speeds, where volumes are above capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion. In the extreme, both speed and volume can drop to zero.	1.00+

SOURCE: Hignway Research Board, Highway Capacity Manual, Special Report No. 87, 1965.

TABLE F-2: PEDESTRIAN LEVELS OF SERVICE

Level of Service	Walking Speed Choice	Conflicts	Pedestrian Flow Rates (P/F/M)* One-Way Flow (Commuters)	Two-Way Flow (Shoppers, etc.)
A	Free Selection	None	8	7
B	Some Selection	Minor	8-11	7-9
C	Restricted	High Probability	11-16	9-14
D	Some Reduction	Multiple	16-21	14-19
E	All Reduced	Frequent	21-26	19-23
F	Shuffle Only	Unavoidable	26**	23**

*P/F/M = Pedestrians per foot of sidewalk width per minute.
**At Level F, the (attempted) flow rate degrades to zero at complete breakdown.

SOURCE: Fruin, J.J., 1971, Pedestrian Planning and Design, Metropolitan Association of Urban Designers and Environmental Planners, New York, N.Y.

METHODOLOGY USED IN CUMULATIVE TRAFFIC AND PARKING IMPACT ANALYSIS

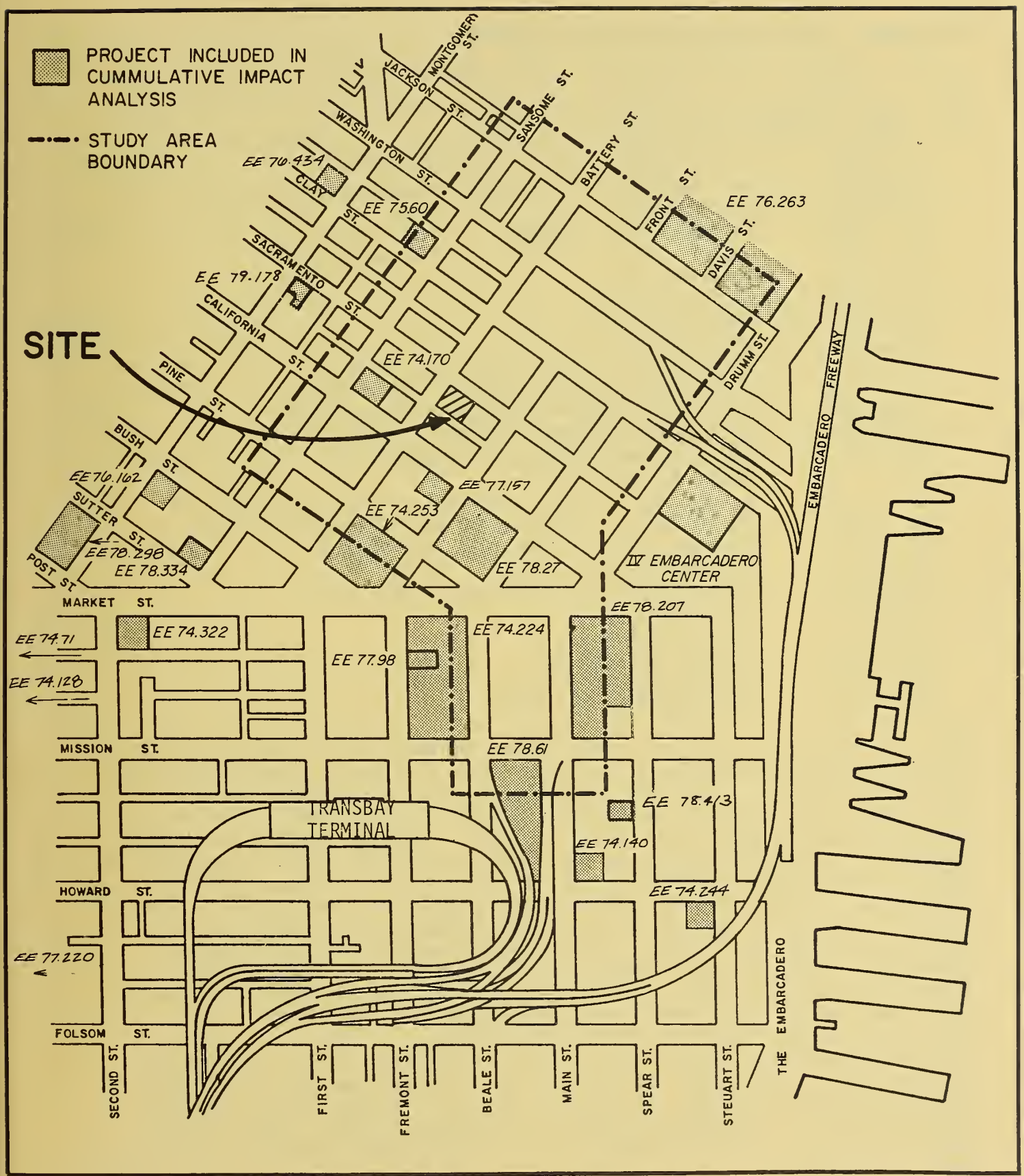
The buildings which were subject to the cumulative traffic and parking analyses are in or near the Financial District (see Figure F-1) and are listed below by their Office of Environmental Review EIR file number and name:

EE 74.140	Howard and Main Sts. (Northeast corner)
EE 74.170	Bank of Tokyo of California (California First Bank)
EE 74.224	333 Market St.
EE 77.98	333 Market St. addendum
EE 74.244	Parking Structure, Howard and Steuart Sts.
EE 74.253	444 Market St.
EE 74.322	595 Market St.
EE 75.60	505 Sansome St.
EE 76.162	180 Montgomery St.
EE 76.263	Golden Gateway Commons Center Plaza Phase III
EE 76.434	601 Montgomery St. (Negative declaration)
EE 77.220	Yerba Buena Center (Convention Center only)
EE 78.61	Pacific Gateway (Administrative Draft)
EE 78.27	101 California St.
EE 78.334	One Sansome St.
EE 78.298	Crocker National Bank
No EE #	Four Embarcadero Center
EE 78.207	Federal Reserve Bank
EE 78.413	150 Spear St.
EE 79.178	456 Montgomery St. DEIR

Because none of the above buildings was in operation in 1976, the base year used for the cumulative analysis was 1976. The 1976 base traffic volumes were expanded to 1981 base traffic volumes by TJKM by an adjusted growth factor of 1.25% per year rather than the 1.8% per year used in the preceding traffic subsections./1/ The latter reflects the highest growth in total office space in the Downtown area whereas the cumulative analysis allocates some of the future growth to the specific projects listed above. Information on the amount of traffic generated by each project that would affect the streets in the Financial District was derived from the EIR or special traffic report on each project. The cumulative traffic from the analyzed projects was added to the 1981 base traffic. Finally, the projected traffic volumes generated by the proposed Daon Building were added to the sum of the 1981 base and cumulative traffic volumes. A similar analysis was conducted to determine cumulative parking impacts.

NOTE

/1/ The 1.8% increase in traffic per year was assumed to be based on the average annual increase in office space which occurred during the Downtown Parking and Traffic Study (DPATS) period of 1965 to 1970. According to a summary table compiled by the Department of City Planning, the annual average increase was 1.7 million sq. ft. per year. To calculate the new growth factor, the annual average increase in gross sq. ft. of office space, exclusive of the buildings to be considered in the cumulative analysis, was determined. This increase was 1.2 million sq. ft. per year, resulting in an adjusted growth factor of 1.25%.



SOURCE: TJKM

FIGURE F-1: PROJECTS INCLUDED IN CUMULATIVE TRANSPORTATION ANALYSIS

METHODOLOGY USED IN CUMULATIVE TRANSIT ANALYSIS

The buildings which were subject to the cumulative transit analysis are in or near the Downtown business district and are listed below by their Office of Environmental Review EIR file number and name:

EE 74.140	Howard and Main Sts. (northeast corner)
EE 74.170	Bank of Tokyo of California (California First Bank)
EE 74.224	333 Market St.
EE 77.98	333 Market St. addendum
EE 74.244	Parking Structure, Howard and Steuart Sts.
EE 74.253	444 Market St.
EE 74.322	595 Market St.
EE 75.60	505 Sansome St.
EE 76.162	180 Montgomery St.
EE 76.263	Golden Gateway Center Phase III
EE 76.434	601 Montgomery St. (Negative declaration)
EE 77.220	Yerba Buena Center (Convention Center only)
EE 78.61	Pacific Gateway (Administrative Draft)
EE 74.71	State Compensation Insurance Building (Ninth & Market Sts.)
EE 74.128	Bank of America Data Center (Eleventh & Market Sts.)
EE 77.220	775 Market St. Office Building (Yerba Buena Center)
EE 77.157	Hibernia Bank (California & Front Sts.)
No EE #	Four Embarcadero Center
EE 78.207	Federal Reserve Bank (Market & Main Sts.)
EE 78.334	One Sansome St.
EE 78.27	101 California St.
EE 78.298	Crocker National Bank
EE 78.413	150 Spear St.
EE 79.178	456 Montgomery St. DEIR

Afternoon peak-hour ridership, exclusive of the buildings listed above, was projected by TJKM from 1978 to 1981 base levels by using a growth factor for each transit agency. The projections were based on information gathered from each agency. For SamTrans and Southern Pacific Railroad (SPRR), SamTrans demand projections were used. Mr. L. Stueck of SamTrans supplied the demand projections for average daily and total yearly patronage for the years 1978 to 1985 for the block of routes that include the mainline routes. A SamTrans projection of SPRR ridership from San Mateo County was also supplied. The percent increase per year for SamTrans and SPRR were calculated from this data. For Golden Gate Transit, the systemwide percent per year increase stated on Page 4-1 of the "Final EIR on Proposed Toll and Fare Increases" (dated July 1978) was used. For BART and A-C Transit the daily ridership for years 1974 through April 1978 was used to project a growth trend. The patronage data was taken from "BART Impact Project - Traffic Survey Series" A-43 to A-50 (October 1974 to April 1978). The growth trend was projected using a linear regression. A total percent increase from 1978 to 1981 was calculated for A-C and BART separately. For Muni, the systemwide increases projected by the Planning, Operations and Marketing (P-O-M) study (Wilbur Smith and Assoc., 1975) were compared to the 1975 data to develop a percent per year increase.

The above growth factors were assumed to reflect total growth (1978 to 1981). An adjustment similar to the adjustment made for traffic growth (i.e. relating the growth in transit ridership to the projected office space increases) was

made. The growth factors were then recalculated to reflect growth exclusive of the buildings listed above. In this case, the office space included in the cumulative projects was assumed to account for 77% of the total growth.

The cumulative ridership from the listed projects was added to the 1981 base ridership thus determined, and the Daon Building ridership was added to the resulting totals. The total ridership increase on Muni cannot be reliably disaggregated on a line-by-line basis because insufficient data are available (C. Kinzel, Traffic Engineer, TJKM, letter communication, 9 May 1979. This letter is available for public review at the Department of City Planning, Office of Environmental Review).

Analysis of the demand-to-capacity ratios was made including known planned expansion of capacity for each transit agency. Thus, the only changes made between 1978 capacity and 1981 capacity were the previously defined changes on BART, Muni Metro and tne Golden Gate Transit Larkspur Ferry. None of the other capacities were increased since no documented (definite) projected increases could be obtained. The capacity increases were assumed to be 7,390 persons per hour total for Muni; 1,620 persons per hour (1,080 seats per hour) total for BART; and 750 persons per hour total for Golden Gate Transit on the Larkspur Ferry only.

APPENDIX G: SAN FRANCISCO AIR QUALITY

Meteorological characteristics such as wind patterns and thermal inversions determine the movement and dispersion of air pollutants. The prevailing wind directions in San Francisco are from the west and northwest. Wind frequencies and speeds are generally highest in the summer. Light-variable wind conditions occur approximately 25% of the time on an annual basis. A thermal inversion (an inverted vertical temperature structure of the atmosphere consisting of warm air above cool air) is a stable atmospheric condition that inhibits the upward dispersion of air pollutants and traps them in a layer near the ground. High-altitude subsidence inversions, associated with warm descending air in a high-pressure cell which may last for several days, occur most of the time in summer and fall. Low-altitude radiation inversions, caused by radiation of heat from the earth's surface into cold nighttime air and usually dissipating by noon, occur most of the time in winter.

Much of San Francisco is generally upwind of major pollutant sources such as industrial areas, airports, freeways and other urban activities. San Francisco is more a contributor to its own air quality problems and to those in other parts of the Bay Area than a recipient of pollutants from other areas. When atmospheric stagnation occurs (as the result of light-variable wind conditions coupled with thermal inversions, most commonly in the fall and winter), the potential exists for the entire Bay Area Air Basin to experience high concentrations of pollutants. Thus, air quality is both a local and regional problem.

The Bay Area Air Quality Management District (BAAQMD) monitoring station at 939 Ellis Street is located on the roof of the 9-story building. While measurements there indicate daily, seasonal, and annual meteorological and air quality trends, it is not clear how well the measurements represent conditions at street level near the station or elsewhere in the City.

TABLE G-1: SAN FRANCISCO AIR POLLUTANT SUMMARY 1976-1978

STATION: 939 Ellis Street, San Francisco

POLLUTANT	STANDARD	1976	1977	1978
OZONE (O_3) (Oxidant)				
1-hour concentration (ppm)/a/				
Highest hourly average	0.08/b,c/	0.13	0.05	0.11
Number of standard violations		2	0	4
CARBON MONOXIDE (CO)				
1 hour concentration (ppm)				
Highest hourly average	35/b/	22	16	17
Number of standard violations		0	0	0
8 hour concentration (ppm)				
Highest 8-hour average	9/b/	11.0	8.9	9.4
Number of standard violations		4	0	1
NITROGEN DIOXIDE (NO_2)				
1 hour concentration (ppm)				
Highest hourly average	0.25/d/	0.25	0.21	0.30
Number of standard violations		1	0	4
SULFUR DIOXIDE (SO_2)				
24 hour concentration (ppm)				
Highest 24-hour average	0.05/d,e/	0.053	0.035	0.024
Number of standard violations/f/		1	0	0
TOTAL SUSPENDED PARTICULATE (TSP)				
24 hour concentration (ug/m^3)/g/				
Highest 24-hour average	100/d/	136	105	128
Number of standard violations/f/		8	1	1
Annual concentration (ug/m^3)				
Annual Geometric Mean	60/d/	55	41	42
Annual violation		No	No	No

/a/ ppm: parts per million.
/b/ Federal standard.
/c/ The ozone standard was revised from 0.08 ppm to 0.12 ppm in January 1979. The number of violations shown are of the standard in effect at that time.
/d/ California standard.
/e/ The sulfur dioxide standard is considered to be violated only if there is a concurrent violation of the ozone or the suspended particulate standard at the same station.
/f/ Number of observed violation days (measurements taken approximately once every six days in 1978 and 1977; once every three days in 1976.
/g/ ug/m^3: micrograms per cubic meter.

SOURCE: Bay Area Air Quality Management District (formerly Bay Area Air Pollution Control District), Contaminant and Weather Summaries.

APPENDIX H: IMPACT OF CUMULATIVE DOWNTOWN DEVELOPMENT ON COMMUNITY SERVICES AND UTILITIES

The buildings proposed, under construction, and recently built which were used to calculate the estimated cumulative totals for water and energy consumption and solid waste and wastewater generation for cumulative San Francisco development are listed below by their Office of Environmental Review EIR file number and name:

EE 74.71	State Compensation Insurance Building (Ninth and Market Sts.)
EE 74.128	Bank of America Data Center (Eleventh and Market Sts.)
EE 74.140	Howard and Main Sts. (northeast corner)
EE 74.170	Bank of Tokyo of California (California First Bank)
EE 74.224	333 Market St.
EE 74.253	444 Market St.
EE 74.322	595 Market St.
EE 75.60	505 Sansome St.
EE 76.162	180 Montgomery St.
EE 76.263	Golden Gateway Center Phase III
EE 77.98	333 Market St. Addendum
EE 77.220	Yerba Buena Center (Convention Center only)
EE 78.27	101 California St.
EE 78.61	Pacific Gateway
EE 78.207	Federal Reserve Bank (Market and Main Sts.)
EE 78.298	Crocker National Bank (Kearny and Post Sts.)
EE 78.334	One Sansome St.
EE 78.413	150 Spear St.
EE 79.178	456 Montgomery St. DEIR
EE 79.57	Daon Building

APPENDIX I: USE AND INTERPRETATION OF ASSOCIATION OF BAY AREA GOVERNMENT'S DRAFT PROJECTIONS 79

The Association of Bay Area Governments (ABAG) forecasts population, employment and housing trends for the 9 Bay Area counties. These projections are used to provide a consistent data base for State and regional programs and to allocate State and Federal funds for capital facilities. ABAG recently updated these forecasts in Projections 79, which was issued in draft form in April 1979. The draft Projections 79 has been reviewed by local governments, special districts and the public and is now being revised. The final adopted projections are not expected to be ready for public distribution until late February 1980.

Because the orientation of Projections 79 is regional, applicability of the data to specific areas and proposed projects is limited. As stated in Appendix A to Projections 79, titled "Illustrative Guidelines for the Use of ABAG Projections", "As projections are extended further into the future, the possibility of divergence from known trends and current policies is greater. As the projections are applied at a smaller and smaller geographic scale, they become less reliable representations of localized conditions."

Interpretation of Data

Although ABAG data do not account for commute and residency patterns, the data may be used to establish some relationship between places of residence and places of work. For the period from 1975-85/1/, ABAG assumptions for San Francisco include a slower rate of housing construction than in the past and a declining family size, resulting in a decrease in population of over 32,000 persons during that period. Coupled with housing and land-use policies and other assumptions on fertility and immigration, this results in a projected increase in the number of employed San Francisco residents of about 10,200 persons and an increase in the number of jobs of all types in San Francisco of about 96,100. This would indicate that, even though San Francisco would decline in population, about 10% to 11% of all new jobs created between 1975 and 1985 would be held by San Francisco residents (see Table I-1).

APPLICABILITY OF THE DATA TO THE PROPOSED PROJECT

For analysis of the proposed Daon Building which is expected to be occupied in 1981, approximately 64% of the project employees have been assumed to be San Francisco residents. This figure falls within the range of 57% to 66% San Francisco residents given in the ABAG Projections 79 for the period between 1975 and 1985 (see Table I-1) and is less than the 67% San Francisco residency of current San Francisco Federal Savings and Loan employees as determined from an analysis of the zip codes of their residences. It is believed that this presents a reasonable estimate of the composition of the employees of the proposed Daon Building in 1981.

Were the analysis to assume that all of the employment in the Daon Building would be new to San Francisco, this would disregard the fact that San Francisco Federal Savings and Loan Association, the prime tenant occuping 20% of the proposed space, plans to relocate its existing offices and employees to the new building and that other firms currently leasing space within the City

Table I-1: INCREMENTAL GROWTH IN TOTAL EMPLOYMENT AND EMPLOYED RESIDENTS, SAN FRANCISCO 1975-80 AND 1980-85

	1975* (Persons)	1985* (Persons)	1975-85 Increase (Persons)
Total Population	672,569	640,501	-32,160
Occupied Dwellings	299,354	307,284	7,930
Employed Residents	327,308	337,488	10,180
Total Employment	495,479	591,564	96,100
Percent of Total Jobs Held by San Francisco Residents	66%	57%	
Increase in Employed Residents as a Percentage of Increased Jobs			10.6%

*ABAG estimates are not rounded.

Source: Association of Bay Area Governments, Draft, April 1979, Projections 79, Table S.F. '75-'80, p. IV-18 and Table S.F. '80-'85, p. IV-19.

would be expected to move to the new building. The assumption, rather, would be that every job in the proposed building would be new to the City and would bear no relation to existing patterns of employment. Making that assumption and using the draft ABAG projections, about 10% to 11% of the estimated 1,220 building employees would be assumed to live within the City; the remainder would be assumed to commute to work from elsewhere.

Secondary Income Generation

Based on San Francisco Federal Savings and Loan employees' average annual disposable income ($14,500 minus 25% taxable gross income), and the ABAG City resident employment incremental increase estimate of 10% to 11%, new employment resulting from the proposed project would generate an estimated $1.4 million of secondary income in the City. Using the same disposable income estimate and the 67% employee resident estimate derived from the San Francisco Federal Savings and Loan zip code survey and existing residency/employment patterns, San Francisco employees at the Daon Building would generate up to $8.7 million in secondary income. All of these employees could not be assumed to be new to San Francisco.

Transportation Analyses

These same assumptions of 10% to 11% San Francisco residents could not also be applied to the transportation analysis of project impacts. Because existing San Francisco firms would move to the project, the San Francisco residency factor of 10% to 11% for building employees derived from the ABAG data could not be representative of actual travel to and from the building. This is in keeping with the ABAG guidelines (quoted above) indicating that the projections become less reliable as they are applied at a smaller and smaller geographic scale. Even were the ABAG estimates to be used as an indication of the residency patterns of new employees ultimately resulting from construction of the additional sq. ft. of office space in San Francisco, this new employment would be spread throughout the City and would not be concentrated within the proposed Daon Building. Therefore, use of the ABAG data as a basis for analysis of the impacts of the project alone would be invalid. The traffic impacts on local streets, for example, would more closely resemble the results given in the Transportation sections of this report (IV.F, p. 77) then they would based an analysis on the draft ABAG projections.

The ABAG data could be applied in a general fashion to the analysis of cumulative traffic impacts where travel would be concentrated in the entry corridors of the Golden Gate and Oakland Bay Bridges and the U.S.101 route from the Peninsula.

Cumulative Traffic Impact Analysis.

The analysis of cumulative traffic impacts in the Transportation Section (IV.F, p. 82) has been based upon a regional distribution of travel derived from employee residence zip codes and regional transportation studies. The regional distribution places the majority of travel within San Francisco (approximately 64% of all trips as shown in Table 11, p. 76). The ABAG projections indicate that the regional distribution used in the traffic analysis may not occur for new trips in the future. Further analysis of the projections indicates that persons residing in Contra Costa County, Solano County, Sonoma County, Napa County and Marin County would most likely fill the new employment opportunities expected to be available in San Francisco.

From the ABAG projections, a new regional distribution has been derived. Table I-2 shows the regional distribution based on the ABAG data and compares it with the distribution used in Table 11 and the existing residency pattern of San Francisco Federal Savings and Loan employees. The ABAG distribution percentages are assumptions made on the basis of data contained in the ABAG projections. ABAG does not project travel modes or travel corridors in the Projections 79 report.

Analysis of the proposed project and the cumulative projects listed in Appendix F, p. 161, using the ABAG distribution shows an increase (over that projected in the analysis in the Transportation section, IV. F, p. 82.) of the number of automobile trips forecast. The same modal split has been used as modal choice data were not able to be derived from the ABAG projections. Under the ABAG distribution, automobile travel from the project would increase by 4% over the previously forecast level. Similarly, the parking demand from the project would increase by 4%.

The cumulative traffic and parking impacts were re-analyzed for the ABAG distribution. Cumulative traffic showed a 54% increase over the previous level and cumulative parking demand would increase by 83%. Table I-3 shows the cumulative traffic forecast conditions. Comparison with Table 16, p. 84 shows the increases resulting from the ABAG distribution. Table I-4 shows the cumulative parking projected conditions. Comparison with Table 18, p. 86 shows the increase over the previously projected conditions.

TABLE I-2: REGIONAL TRAVEL DISTRIBUTION (Home to work)

Area of Residence	ABAG Distribution	Table 11* Distribution	SF Federal** Residency
San Francisco	10%	64%	67%
East Bay	50%	13%	19%
Peninsula	20%	17%	12%
North Bay	20%	6%	2%
	100%	100%	100%

*Includes travel other than home-to-work.
**99% sample of employees' place of residence by zip code.

Source: TJKM

The traffic conditions developed in this analysis are more congested than the conditions developed in the analysis in the Transportation Section. The analysis using the ABAG distribution is a worst-case analysis for automobile traffic. The conditions forecast using the ABAG-based distribution would most likely not develop as projected as the freeway system serving San Francisco would not be able to carry the forecast volumes without significant change from the existing condition, and parking would not be available to meet the projected demand. If no change in the freeway system were made and no additional parking were provided near the Downtown area, a major shift in modes of travel would have to occur. Trips would be expected to shift from the automobile to BART, A-C Transit, Golden Gate Transit, SamTrans and other transit agencies.

Muni. Use of the ABAG data would produce a reduced impact on the Muni, because Muni is used predominantly by San Francisco residents. The project site is within walking distance of BART, the Transbay Terminal, and Golden Gate Transit and SamTrans lines, so few transfer trips to Muni would be expected. Therefore, the Transit Impact section did not use the draft ABAG projections, but used estimates showing worst-case effects on the Muni.

TABLE I-3 CUMULATIVE TRAFFIC IMPACTS IN 1981 (Using ABAG Draft Projections 79)

Street	1981 Base*(veh.) 24-Hr	Peak Hr**	1981 Base + A*(veh.) 24 Hr	Peak Hr	% Increase*** 24 Hr	Peak Hr	Base + A + B*(veh.) 24 Hr	Peak Hr	% Increase + 24 Hr	Peak Hr
Beale	8,400	1,100	23,350	3,910	180	262	23,810	4,020	2	3
Main	14,300	1,600	29,250	4,450	105	175	29,770	4,560	2	2
Clay	30,300	2,400	45,300	5,210	49	119	45,820	5,310	1	2
Washington	16,200	2,000	31,190	4,880	93	72	31,710	4,980	2	2

*Base = Expanded 1976 vehicle volumes.
A = Vehicle volumes from buildings considered in cumulative analysis.
B = Vehicle volumes from the proposed Daon Building.
**The peak hour for Beale and Clay Sts. occurs during the peak period between 4:00 and 6:00 p.m. The peak hour for Main and Washington Sts. occurs during the peak period between 7:00 and 9:00 a.m.
***Percent increase of 1981 + A over 1981 base; percentage may not be directly derived from Table due to rounding. Percent increase was calculated by dividing incremental increase between two conditions by the earlier condition.
+Percent increase of 1981 + A + B over 1981 + A; percentage may not be directly derived from Table due to rounding.

TABLE I-4 CUMULATIVE PARKING IMPACTS - PROJECTED OFF-STREET PARKING DEMAND IN 1981 (Using ABAG Draft Projections 79)

	Cumulative	Cumulative Plus Daon Building
Available Spaces in 1976	570 spaces	570 spaces
Net Gain (loss) of 1976 Spaces	60 spaces	60 spaces
Available Spaces in 1981	510 spaces	510 spaces
Projected Parking Demand	12,570 spaces*	13,230 spaces
Net Parking Surplus (Deficit)	(12,060)spaces	(12,720)spaces

*Not counting that from growth other than the projects considered in the cumulative traffic analysis.

NOTE

/1/ The ABAG projections cover the period from 1975 to 2000 in 5-year increments. The period from 1975 to 1985 is used for comparison in this report because all of the buildings included in the cumulative analyses have been or are proposed to be built and occupied during that period.